A CORRELATIONAL STUDY OF JUNGIAN TYPOLOGY, AS MEASURED BY THE MYERS-BRIGGS TYPE INDICATOR, AND EDUCATIONAL COGNITIVE STYLE, AS MEASURED BY THE OAKLAND COMMUNITY COLLEGE COGNITIVE STYLE MAP INTEREST INVENTORY

BY

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TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS ii

ABSTRACT vi

CHAPTER I--INTRODUCTION. 1
- The Need for the Study. 1
- Problem Statement 3
- Context of the Study. 3
- Population Sample 4
- Design. 5
- Hypotheses. 6
- Data Analysis 10
- Assumptions 10
- Limitations 11
- Definition of Terms 11
- Notes 16

CHAPTER II--REVIEW OF RELATED LITERATURE. 17
- Literature of the Myers-Briggs Type Indicator 17
- Oakland Cognitive Style Map 26
- Summary 32
- Notes 33

CHAPTER III-METHODOLOGY OF THE STUDY 37
- Population. 37
- Instrumentation 40
  - Myers-Briggs Type Indicator Construction 40
  - Oakland Cognitive Style Map Interest Inventory Construction 43
- Data Collection 54
- Design. 55
- Hypotheses Generation Methodology 55
  - Hypothesis 1. 55
  - Hypothesis 2. 56
  - Hypothesis 3. 56
  - Hypothesis 4. 56
  - Hypothesis 5. 57
  - Hypothesis 6. 57
  - Hypothesis 7. 58
  - Hypothesis 8. 58
  - Hypothesis 9. 58
  - Hypothesis 10. 59
  - Hypothesis 11. 59
  - Hypothesis 12. 59
  - Hypothesis 13. 60
  - Hypothesis 14. 60

Hypothesis 15. 60
Hypothesis 16. 61
Hypothesis 17. 61
Hypothesis 18. 61
Hypothesis 19. 62
Hypothesis 20. 62
Hypothesis 21. 63
Hypothesis 22. 63
Hypothesis 23. 63
Hypothesis 24. 64
Hypothesis 25. 64
Hypothesis 26. 64
Hypothesis 27. 65
Hypothesis 28. 65
Hypothesis 29. 65
Hypothesis 30. 65
Hypothesis 31. 66
Hypothesis 32. 66
Hypothesis 33. 66
Hypothesis 34. 67
Hypothesis 35. 67
Data Analysis 68
Notes 69

CHAPTER IV--ANALYSIS OF DATA. 71
Analysis of Data. 71
Hypothesis 1. 71
Hypothesis 2. 74
Hypothesis 3. 75
Hypothesis 4. 75
Hypothesis 5. 76
Hypothesis 6. 76
Hypothesis 7. 77
Hypothesis 8. 77
Hypothesis 9. 78
Hypothesis 10. 78
Hypothesis 11. 78
Hypothesis 12. 79
Hypothesis 13. 79
Hypothesis 14. 80
Hypothesis 15. 80
Hypothesis 16. 80
Hypothesis 17. 81
Hypothesis 18. 81
Hypothesis 19. 82
Hypothesis 20. 82
Hypothesis 21. 83
Hypothesis 22. 83
Hypothesis 23. 84
Hypothesis 24. 84
Hypothesis 25. 85

Page

Hypothesis 26. 85
Hypothesis 27. 86
Hypothesis 28. 86
Hypothesis 29. 86
Hypothesis 30. 86
Hypothesis 31. 87
Hypothesis 32. 87
Hypothesis 33. 88
Hypothesis 34. 88
Hypothesis 35. 89

CHAPTER V--SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS . . . 90
Summary 90
Conclusions 90
Recommendations 95
Notes 97

APPENDIX A 99
APPENDIX B 121
APPENDIX C 128
APPENDIX D 131

BIBLIOGRAPHY 135

BIOGRAPHICAL SKETCH. 139

Abstract of Dissertation Presented by the Graduate Council
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A CORRELATIONAL STUDY OF JUNGIAN TYPOLOGY, AS MEASURED BY THE MYERS-BRIGGS TYPE INDICATOR, AND EDUCATIONAL COGNITIVE STYLE, AS MEASURED BY THE OAKLAND COMMUNITY COLLEGE COGNITIVE STYLE MAP INTEREST INVENTORY

By

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The purpose of this study was to obtain statistical evidence to determine if the Myers-Briggs Type Indicator (MBTI) correlated sufficiently with the Oakland Community College Cognitive Style Map Interest Inventory (OSCM) to warrant an assumption that they are measuring similar individual traits.

The population was made up of students enrolled in seven high schools and two junior colleges in the state of Florida. The sample population, totaling 172 students, consisted of one class randomly selected from each of the participating schools.

The correlational study examined the student MBTI types and OCSM major scores for each member of the sample. Using the product-moment correlation technique, correlations were produced to confirm or deny thirty-five predictive hypotheses which had been generated by deciding which of the constructs of Jungian typology as measured by the MBTI were theoretically similar to each of the twenty-seven elements of the OCSM

Interest Inventory. The assistance of an expert in Jungian typology was obtained in constructing the hypotheses.

The resulting correlations confirmed fifteen of the thirty-five predictive hypotheses. These hypotheses were confirmed or denied at .05 using a Chi square with one degree of freedom.

One major conclusion was drawn: considering that only thirty-five hypotheses were projected out of a large number of possible hypotheses, and considering that 57% of the hypotheses were denied, it must be concluded that, in this study, MBTI and OCSM Interest Inventory were only loosely related and were measuring very few personological variables in common. Possible reasons for the low number of correlations were considered.

CHAPTER I

INTRODUCTION

The Need for the Study

Educators have long recognized that students learn in different ways, but until recently, student preferences for different learning styles have seldom been the subject of systematic empirical study. Most studies concentrated on heredity or environment as the key to individual differences. An example of this position is that of Watson who stated, "Give me a dozen healthy infants, well formed, and my own specified world to bring them up in, and I'll guarantee to take any one at random and train him to become any type of specialist I might select."[1]

This challenge of Watson's specified world was well beyond the capacity of the public school system. However, school learning and teaching practices were not and others were considering this as the key to individual differences. Kilpatrick wanted teachers to "seek to have pupils engage in desirable purposeful activities, where the ends thus set up are the pupil's own and are felt and pursued as such."[2]

These "felt needs" did not always lead to productive activity, nor were the individuals always aware of their strengths and weaknesses. Therefore, there was a distinct need for some type of educational tool to assist the teacher in this area of assessment of individual differences.

While educators agree that students learn in individual ways, the methods with which they seek to measure these differences vary widely. Two measures used with increasing frequency are the Oakland Cognitive Style Map (OCSM) and the Myers-Briggs Type Indicator (MBTI).

The OCSM is an inventory which yields a profile of the student's methods of gaining meaning from the environment. Developers say that, utilizing the OCSM categories, the instructor can design methods and materials in terms of individual cognitive style.

The MBTI is a personality inventory which yields a profile that indicates the student's choice of the type of judgment and perception he or she prefers to use in dealing with the environment. Users of the MBTI see it as a means of selecting compatible teaching strategies and learning tasks.

While using these two inventories in a field project, this writer noted similarities in the information being provided. It was at this point that the question arose as to whether the two instruments were measuring some of the same variables.

In order for the instructional designer or curriculum planner to take advantage of the data provided by the OCSM and the MBTI, the roles of these instruments must be clarified. To this end, this study has attempted to compare the elements of the OCSM and the types of the MBTI.

Problem Statement

The Oakland Community College Cognitive Style Map and the Myers-Briggs Personality Type Indicator are being used with increasing frequency to place individual students in a learning situation on the premise that the instruments make possible a better match between individual traits and situational features. Some instructional designers have assumed that the two inventories measure similar variables; however, this assumption has not been adequately tested. The problem of this study was to obtain statistical evidence that the two instruments do or do not correlate sufficiently to warrant the assumption that they are measuring similar individual traits.

Context of the Study

The data for this study were gathered during the Aviology Project which was designed by Dr. Paul A. Becht and Dr. Thomas Gadsden, Jr. and was funded by the Florida Educational Research and Development Program. The Aviology Concept was begun at the P.K. Yonge Laboratory School of the University of Florida. The concept was originally formulated as a way to teach physics through aviology to students who would not normally study physics. The program is a collection of interdisciplinary materials arranged in flexible modules that can be used in any combination for a year-long course, a semester course, or a nine-week course. The students involved in this study were enrolled in a year-long course with one exception: those at St. Petersburg Junior College were enrolled in a one-semester course. To personalize the modules, the OCSM Interest Inventory and the MBTI were used to suggest the most effective and efficient modes of learning for an individual and to help the instructor prescribe for that individual the optimum sets of learning experiences.

To carry out the field evaluation, nine project schools were involved and 321 students participated. The students in the study were randomly selected from those taught by the participating teachers.

Each of the participating teachers was involved in a one-week summer workshop and an in-service program one Saturday per month for the school year. This training included the use of the OCSM, the MBTI, and the relationship of the concepts of the two instruments to the assignment of modules to the students.

In using and explaining the theories of the two instruments, the project staff saw apparent relationships between them. A natural off-shoot of the project was a computer analysis to compare the two sets of data taken on the aviology students.

Population Sample

To classify the learning preferences or styles of the students, the 321 participants were given the OCSM Interest Inventory and the MBTI. The inventories were administered on alternate class days to allow the students to have some recovery time between administrations.

From that total population, this investigator selected one class from each school to be included in the study. St. Petersburg Junior College offered the aviology course as a semester course rather than a year-long course and, as a result, had two different populations. Therefore, one class from each semester was included in the study. Through this selection process, the total sample population became 172 students.

The nine schools included in the study contributed the following number of students to the sample population:

Table 1
School Contribution to
Population Sample

School	Population
St. Petersburg Junior College	42 students
Osceola High School	22 "
Suncoast High School	22 "
Hialeigh High School	21 "
Melbourne High School	21 "
Lakewood High School	21 "
Lake Brantly High School	12 "
P.K. Yonge High School	6 "
Palm Beach Junior College	5 "
Total Population Sample	172 students

Design

This was a correlation study examining relationships between the student reported MBTI types and the student reported OCSM major scores. These data were compared using the product-moment correlation coefficient. The results of these correlations were used to confirm or deny thirty-five predictive hypotheses which had been generated by comparing the theoretical constructs of the Jungian typology as measured by the MBTI and the cognitive learning styles of Hill as measured by the twenty-seven elements of the OCSM paper-and-pencil Interest Inventory. These hypotheses had been constructed by the investigator with the aid of Dr. Mary McCaulley of the Center for Applications of Psychological Type (C.A.P.T.) located in Gainesville, Florida.

Hypotheses

Hypothesis 1

There is predicted to be a positive relationship between the OCSM element Theoretical Auditory Linguistic and the MBTI attitude Extraversion.

Hypothesis 2

There is predicted to be a positive relationship between the OCSM element Theoretical Auditory Linguistic and the MBTI function Intuition.

Hypothesis 3

There is predicted to be a positive relationship between the OCSM element Theoretical Auditory Quantitative and the MBTI attitude Extraversion.

Hypothesis 4

There is predicted to be a positive relationship between the OCSM element Theoretical Visual Linguistic and the MBTI combination of the attitude Introversion and the function Intuition.

Hypothesis 5

There is predicted to be a positive relationship between the OCSM element Theoretical Visual Quantitative and the MBTI combination of the attitude Introversion and the function Intuition.

Hypothesis 6

There is predicted to be a positive relationship between the OCSM element Qualitative Auditory and the MBTI function Intuition.

Hypothesis 7

There is predicted to be a positive relationship between the OCSM element Qualitative Olfactory and the MBTI function Intuition.

Hypothesis 8

There is predicted to be a positive relationship between the OCSM element Qualitative Savory and the MBTI function Intuition.

Hypothesis 9

There is predicted to be a positive relationship between the OCSM element Qualitative Tactile and the MBTI function Intuition.

Hypothesis 10

There is predicted to be a positive relationship between the OCSM element Qualitative Visual and the MBTI function Intuition.

Hypothesis 11

There is predicted to be no positive relationship between The OCSM element Qualitative Proprioceptive and any MBTI function or attitude.

Hypothesis 12

There is predicted to be a positive relationship between the OCSM element Qualitative Code Empathetic and the MBTI attitude Extraversion.

Hypothesis 13

There is predicted to be a positive relationship between the OCSM element Qualitative Code Empathetic and the MBTI function Feeling.

Hypothesis 14

There is predicted to be no positive relationship between the OCSM element Qualitative Code Esthetic and any MBTI attitude or function.

Hypothesis 15

There is predicted to be a positive relationship between the OCSM element Qualitative Code Ethics and the MBTI attitude Introversion.

Hypothesis 16

There is predicted to be a positive relationship between the OCSM element Qualitative Code Ethics and the MBTI function Thinking.

Hypothesis 17

There is predicted to be a positive relationship between the OCSM element Qualitative Code Histrionics and the MBTI attitude Extraversion.

Hypothesis 18

There is predicted to be a positive relationship between the OCSM element Qualitative Code Kinesics and the MBTI attitude Extraversion.

Hypothesis 19

There is predicted to be a positive relationship between the OCSM element Qualitative Code Kinesics and the MBTI combination of the functions Intuition and Feeling.

Hypothesis 20

There is predicted to be a positive relationship between the OCSM element Qualitative Code Kinesthetics and the MBTI function Sensing.

Hypothesis 21

There is predicted to be a positive relationship between the OCSM element Qualitative Code Proxemics and the MBTI attitude Extraversion.

Hypothesis 22

There is predicted to be a positive relationship between the OCSM element Qualitative Code Proxemics and the MBTI attitude Perception.

Hypothesis 23

There is predicted to be a positive relationship between the OCSM element Qualitative Code Synnoetics and the MBTI function Intuition.

Hypothesis 24

There is predicted to be a positive relationship between the OCSM element Qualitative Code Synnoetics and the MBTI attitude Judgment.

Hypothesis 25

There is predicted to be a positive relationship between the OCSM element Qualitative Code Transactional and the MBTI attitude Extraversion.

Hypothesis 26

There is predicted to be a positive relationship between the OCSM element Qualitative Code Transactional and the MBTI function Feeling.

Hypothesis 27

There is predicted to be no positive relationship between the OCSM element Associates and any MBTI attitude or function.

Hypothesis 28

There is predicted to be a positive relationship between the OCSM element Family and the MBTI attitude Extraversion.

Hypothesis 29

There is predicted to be no positive relationship between the OCSM element Individuality and any MBTI attitude or function.

Hypothesis 30

There is predicted to be a positive relationship between the OCSM element Difference and the MBTI type ENTP.

Hypothesis 31

There is predicted to be a positive relationship between the OCSM element Appraisal and the MBTI function Intuition.

Hypothesis 32

There is predicted to be a positive relationship between the OCSM element Appraisal and the MBTI attitude Perception.

Hypothesis 33

There is predicted to be a positive relationship between the OCSM element Magnitude and MBTI type ESTJ.

Hypothesis 34

There is predicted to be a positive relationship between the OCSM element Relationship and the combination of the functions Intuition and Thinking.

Hypothesis 35

There is predicted to be a positive relationship between the OCSM element Deductive and the MBTI function Thinking.

Data Analysis

Two steps were used in analyzing the data. First the data were broken down by MBTI type and the strength of score on the OCSM (major, minor, or negative) for each of the twenty-seven elements of cognitive style. Second, the OCSM major scores of each student were compared with his/her MBTI type and the resulting group analysis was presented in the form of a Chi square calculation or, for smaller cells of data, in the form of Fisher's Exact Probability.

Assumptions

The generalizability of the findings of this study rests on four assumptions. The first is that the group of students tested does not differ from the samples of people used in the construction of the two instruments; that is, the group of students does not differ in ways that would affect their manner of responding to the instruments.

The second assumption is that the students were not affected in answering questions on one instrument by answers given on the other. This is one reason for having a one-day break between testing. Also, some schools administered the MBTI on the first day, others administered the OCSM on the first day.

The third assumption is that the construct validity of the two instruments used to measure learning preferences or styles was not altered by the conditions under which these instruments were administered.

The fourth assumption is that no unusual circumstances existed so as to alter the moods or attitudes of the students in ways that may affect their taking the instruments.

Limitations

Both instruments are paper-and-pencil self-reports and are mass administered. Therefore, the data from the instruments, and the results of this investigation, should be interpreted in light of the limitations inherent in all such instruments.

Both instruments presuppose an eighth grade reading level. It is therefore, possible that some of the vocabulary may be beyond the experience of some of the subject students.

The findings of the investigation are limited by the strength of the validity and reliability of the two instruments, matters which are discussed in this dissertation.

Definition of Terms

Personality. A reference to Carl G. Jung's theory of personality as explained in his book, PSYCHOLOGICAL TYPES.[3]

Preference type or type. A reference to any one of the sixteen theoretical personality structure patterns as postulated by Jung and measured by the Myers-Briggs Type Indicator.

Attitude. A reference to one of the following elements of Jung's theory of personality: extraversion-introversion or judgment-perception.

Function. A reference to one of the following elements of Jung's theory of personality: sensation, intuition, thinking, or feeling.

Extraversion and Introversion (EI). The EI index is designed to reflect whether the person is an extravert or an introvert in the sense intended by Jung, who coined the terms. Extraverts are oriented primarily to the outer world, and thus tend to focus their perception and judgment upon people and things. Introverts are oriented primarily to the inner world postulated in Jungian theory, and thus tend to focus their perception and judgment upon concepts and ideas.[4]

Judgment and Perception (JP). Judgment is the attitude of reaching a conclusion about something. Perception is the attitude of becoming aware of something. As these terms are used in reference to personality types, Judgment (J) refers to one who likes a planned, decided, orderly way of life. Perception (P) refers to one who likes a flexible, spontaneous way of life.

Sensing and Intuition (SN). Sensing is the psychological function which transmits a physical stimulus to perception. It is sense perception.[5] Intuition is the psychological function which "transmits perception in an unconscious way."[6] It is "a kind of instinctive apprehension."[7] Sensing (S) refers to one who would like to work with facts. Intuition (N) refers to one who would rather look for possibilities and relationships.

Thinking and Feeling (TF). Thinking is active or passive thought activity of a logical nature which tries to uncover facts in an impersonal manner.[8] Feeling is that function concerned with an "apperception of value." It sets up subjective criteria of acceptance or rejection.[9] As these terms are used in reference to personality types, Thinking (T) refers to one who bases judgments more on impersonal analysis and logic, while the Feeling (F) type bases judgment more on personal values.

Cognitive Style. As Hill characterizes cognitive style, it consists of three "sets": Set 1--Symbols and their meanings, Set 2--Cultural Determinants, Set 3--Modalities of Inference.[10] It is the mode of behavior an individual employs while searching for meaning. It is the total pattern of receiving and processing information.

Theoretical Symbol. It is that which represents something to the individual other than that which the symbol is in reality. The cursive or printed word, or a numeral representing a number, is an example of a theoretical symbol.

The four theoretical symbols in the OCSM are:

T(VL)--Theoretical Visual Linguistic--ability to find meaning from words you see (reading).

T(AL)--Theoretical Auditory Linguistic--ability to acquire meaning through hearing spoken words.

T(VQ)--Theoretical Visual Quantitative--ability to find meaning from numerical symbols, relationships, and measures that are written.

T(AQ)--Theoretical Auditory Quantitative--ability to acquire meaning through numerical symbols, relationships, and measures that are spoken.

Qualitative Symbol. It is that which represents to the individual only that which it is in reality. Simply, it is the observation of the object itself.

The qualitative symbols in the OCSM associated with the sensory stimuli are:

Q(A)--Qualitative Auditory--sense of hearing.

Q(O)--Qualitative Olfactory--sense of smell.

Q(S)--Qualitative Savory--sense of taste.

Q(T)--Qualitative Tactile--sense of touch.

Q(V)--Qualitative Visual--sense of sight.

The qualitative symbol in the OCSM associated with both motor responses and skill (referred to as programmatic ability) is:

Q(P)--Qualitative Proprioceptive--the ability to combine two or more senses without really thinking about it; this takes into consideration such things as right and left-handedness and physical timing (playing a musical instrument).

The qualitative symbols in the OCSM associated with cultural codes are:

Q(CEM)--Qualitative Code Empathetic--the ability to be sensitive to the feelings of others.

Q(CES)--Qualitative Code Esthetic--the ability to be sensitive to the beauty of an object or an idea.

Q(CET)--Qualitative Code Ethics--the ability to commit oneself to a set of values (does not imply morality).

Q(CH)--Quality Code Histrionics--the ability to act or play a role.

Q(CK)--Qualitative Code Kinesics--the ability to use and understand body language to communicate (facial expressions and gestures).

Q(CKH)--Qualitative Code Kinesthetics--motor skill ability.

Q(CP)--Qualitative Code Proxemics--the ability to know and understand social distance.

Q(CS)--Qualitative Code Synnoetics--the ability to know one's strengths and weaknesses so as to set realistic goals.

Q(CT)--Qualitative Code Transactional--the ability to persuade others.

Cultural Determinants. It is the influences of one's background upon the meaning of symbols. There are three cultural factors expressed in the OCSM:

A--Associates--interpretation of symbols influenced by peers.

F--Family--interpretation of symbols influenced by authoritarian figures i.e. parents or teachers.

I--Individuality--interpretation of symbols influenced by one's own judgment.

Modalities of Inference. It is a reasoning pattern that can be classified as either an inductive process or a deductive process, depending upon the manner in which the conclusion is reached. It is both the process and the conclusion.

The five modalities of inference in the OCSM are:

Inductive

M--Magnitude--the process of using norms or categorical classifications to define objects in order to understand them.

D--Difference--the process of reasoning in terms of one-to-one contrasts or comparing selected characteristics.

R--Relationship--the process of synthesizing and discovering component parts through analysis of a situation.

L--Appraisal--the process of weighing equally the hypotheses of Magnitude, Difference, and Relationship in arriving at a probable conclusion.

Deductive

K--the process of working logically with assumed rules or "givens" from general to specific concepts.

Notes--Chapter 1

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4. Myers, Isabel Briggs, Manual (1962): The Myers-Briggs Type Indicator. Palo Alto, California: Consulting Psychologists Press, 1962, 1975, p. 1.

5. Jung, pp. 585-88.

6. Ibid., pp. 567-69.

7. Ibid.

8. Ibid., pp. 611-12.

9. Ibid., pp. 543-47.

10. This definition, and all the subsequent ones, are taken from Lawrence Wasser, The Educational Science of Cognitive Style. Bloomfield Hills, Michigan: Oakland Community College Press, 1971.

CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose in this study was to investigate the relationship of the two instruments being used to identify and plan for the learning needs of individual students. Since the study focused on the possibility that the two inventories were measuring similar characteristics of the learner, it was appropriate to review the theoretical background of each instrument and the research concerning student academic differences in relationship to student placement on the respective instruments.

Literature of the Myers-Briggs Type Indicator

In 1921, Carl G. Jung, a Swiss psychiatrist, published a personality theory which was part of a 700 page work entitled Psychological Types, or The Psychology of Individuation. This work had been the result of Jung's concern with World War I and his desire to understand man's self-destructive tendencies. Over two-thirds of the work concerns a wide range of philosophical considerations covering those from antiquity to Jung's time and from Eastern to Western philosophy. After this thoughtful review, Jung used the last 240 pages to present his own theory, a definition of terms, and a conclusion which stresses the importance of understanding psychological differences. To Jung, it was these differences that cause conflicting interpretation of the same information and create the difficulties of man. Information has no emotional context until it is interpreted by the individual and becomes his "facts."

Jung had been a disciple of Freud, but split with Freud because Jung believed in a more spiritual aspect of personality.[1] However, his association with Freud did have a lasting impact in that Jung believed that personality was influenced more by genetics than by environment[2] and he distinguished his first two dimensions of personality type by the direction of their interest, or of the movement of the libido, a Freudian term. Jung called these first two dimensions extraversion and introversion (EI) and classified them as psychological attitudes. Also in this theory, Jung identified the psychological functions: sensation and intuition (SN), the two modes of perception, and thinking and feeling (TF), the two ways of making judgments.

His first two terms "extraversion" and "introversion" have come into popular usage, but they are often misused. Not only has the general public distorted Jung's terms but, reported by H. A. Murray, many professional psychologists have discarded much of what Jung considered important and have "vulgarized" Jung's basic idea. According to Murray, Jung's complete descriptions of personality type differences are "more insightful, richer in anecdote and reference and more suggestive theoretically than anything that is found in the literature of personology." However, Murray also states that Jung might have helped his own cause by "systematically setting down in one place a condensed list of what he considered to be crucial indices of extraversion and introversion, respectively."[4]

While Jung himself apparently did not see the possible research benefits of constructing a method of measuring his constructs in the general population, several other individuals have used his theory as a basis for their psychological instruments. The most well known of these is Isabel Briggs Myers who, with her mother, began gathering data during World War II. From these data, she developed the Myers-Briggs Type Indicator (MBTI) which is a self-report, forced-choice questionnaire.

Drawing from Jungian theory, Myers has produced not one but two pairs of psychological attitudes to accompany the four functions (SN and TF). She added judgment-perception (JP) as a necessary adjunct to the attitudes of extraversion-introversion as presented by Jung. As amended, the psychological attitudes would be defined as in the following paragraph.

The Extravert has a positive relation to an object. "The object can never have enough value for him, and its importance must always be increased."[5] His concern is directed more toward people and things in the outer world. The extravert "thinks, feels, and acts, in a word *lives*, as to correspond *directly* with objective conditions and their claims, whether in a good sense or ill."[6]

The Introvert is oriented more toward the subject rather than the object. "He is always intent on withdrawing libido from the object, as though he had to prevent the object from gaining power over him."[7] His concern is with the realm of the inner world or self. The introvert "thinks, feels, and acts in a way that clearly demonstrates that the subject is the chief factor of motivation."[8]

In the second pair, Judgment is the attitude of reaching a conclusion about something and Perception is the attitude of becoming aware of something.

According to Myers, the preference of one of these attitudes points the way to a dominant force in the personality of the individual. By having this dominant force, the individual is able to be consistent in his/her choices and not reverse himself/herself without sufficient cause.

The extravert lives in the outer world of people and, as such, prefers to use the choice of dominant _function_ to deal with the outer world. If the extravert is a judging type, the dominant _function_ is thinking or feeling. If he/she is a perceptive type, the dominant _function_ will be either sensing or intuition.

With the introvert, the important life lies within the inner world of concepts and ideas. It is in this realm that the introvert concerntrates his or her dominant function. The introvert relies upon the auxiliary (second function) to deal with the outer world of people.

> The result is a paradox. When the dominant process that governs an introvert is a judging process, either thinking or feeling, he does not _outwardly_ act like a judging person. What shows on the outside is the perceptiveness of his auxiliary process (sensing or intuition), and he lives his outer life mainly in the perceptive attitude. His inner judgingness is not apparent until something comes up which is important to his inner world. At such moments he may take a startlingly positive stand.[9]

Introverts will choose J or P as they live their outer lives but this choice will point to the auxiliary process not to the dominant process.

The four functions were referred to in the above discussion. They are paired as Sensing and Intuition (functions of perception) and Thinking and Feeling (functions of judgment).

According to Jung, Sensing is the psychological function which transmits a physical stimulus to perception--it is sense perception.[10] As described by Myers, it is, more simply, what "your eyes and ears and other senses tell you . . . is actually there and is actually happening."[11]

Jung writes that Intuition is the psychological function which "transmits perception in an unconscious way . . . a kind of instinctive apprehension."[12] Myers believes that it "shows you meanings and relationships and possibilities that are beyond the reach of your senses."[13]

Thinking, in Jung's theory, is active or passive thought activity of a logical nature which tries to uncover facts in an impersonal manner.[14] Myers states that it "predicts the logical result of any particular action you may take. Then it decides impersonally, on the basis of cause and effect."[15]

Feeling, on the other hand, according to Jung, sets up a subjective criteria on which to base personal decisions. It is concerned with an "apperception of value."[16] To this statement, Myers would add, "Feeling takes into account anything that matters or is important to you or to other people (without requiring that it be logical)."[17]

The attitudes and functions have been combined into sixteen types and are measured by the Myers-Briggs Type Indicator. In summary, the purpose of the MBTI as stated by Myers is:

> . . . The gist of the theory is that much apparently random variation in human behavior is actually quite orderly and consistent, being due to certain basic differences in the way people prefer to use perception and judgment.
>
> "Perception" is here understood to include the processes of becoming aware, - of things or people or occurences or ideas. "Judgment" is understood to include the process of coming-to-conclusions about what has been perceived. If people differ systematically in what they perceive and the conclusions they come to, they may as a result show corresponding differences in their reactions, in their interests, values, needs, and motivations, in what they do best and in what they like best to do.
>
> Adopting this working hypothesis, the Indicator aims to ascertain, from self-report of easily reported reactions, people's basic preferences in regard to perception and judgment, so that the effects of the preferences and their combinations may be established by research and put to practical use.[18]

In type theory, every person uses all four functions and all four attitudes continually, but not with equal facility. Introverting is less easy for the extravert, sensing is less developed in the person who prefers intuition, etc.

Several studies using the MBTI have been made to determine the relationship between type and academic differences in diverse learning situations. It was shown by McCaulley (1974) that intuitive individuals excel in traditional learning settings and standard test and measurement situations. McCaulley presented the following chart:[19]

Populations	Sensing	Intuitive
General population	65% to 75%	25% to 35%
500 adults who did not finish 8th grade	99.6%	.4%
168 rural 7th graders	78%	22%
135 underprivileged university students	78%	22%
118 rural high school students	72%	28%
198 university high school students	54%	46%
1430 non-academic 11th and 12th graders (Pa.)	85%	15%
3503 academic 11th and 12th graders (Pa.)	58%	42%
3676 Ivy League freshmen	41%	59%
1709 Auburn freshmen ('64)	65%	35%
2514 Florida freshmen ('72)	45%	55%
1101 National Merit Scholarship Finalists	18%	82%

McCaulley's chart seems to indicate that traditional education does not take into consideration the learning differences of sensing individuals who need concrete experience in order to reach their potential.

In 1969 Barberousse constructed a nontraditional learning situation at Walt Whitman High School in Oakton, Virginia, which allowed students who were not challenged by the standard curriculum to select learning environments which were compatible with their personality type. It centered around an alternative humanities program that allowed for an interdisciplinary approach to the subjects of English, art, music, world history, philosophy, and behavioral science. It allowed the students to select from one of the five subject areas and use this area concentration to work on six themes during the year. This was a very innovative program when compared to the regular curriculum at the school.

One hundred seventy-two students volunteered to take the course and 100 were randomly selected to participate. However, 42 of the 100 students indicated that this approach was still too structured and requested that they be allowed to work independently and develop their own goals and activities.

Barberousse hypothesized that those who volunteered would be those whose needs were not being met in the traditional program. When 42 of these students opted for independent study, it was further hypothesized that these 42 would be of a type that could only stand structure which was of a self-imposed variety; those individuals favoring N and P, according to MBTI theory.[20]

The first hypothesis was supported when it was found that 77% of the 100 students had a perceptive preference. The second hypothesis was supported when it was found that 90% of the 42 independent study students had a perceptive preference. Within the same group 87% of the students preferred the combination of intuition and perception.[21]

In an earlier study, Barberousse (1965) had found that the ENFP type consistently scored highest on all six of the standardized tests measuring creative thinking factors. In a traditional test and measurement situation it was found that students with the highest IQ scores were those who preferred intuition, extraversion, feeling, and perceiving; again the ENFP.[22]

May (1971) replicated the IQ tests and found that it was intuitive types that had the higher scores. He also found that the intuitive type students score higher on written arithmetic computation, concepts, and applications tests than do the sensing type students. Again, it seems that sensing students who are faced with paper-and-pencil tests dealing with abstract concepts do not excel.[23]

Tillman (1976) tested 50 Upward Bound students at the University of Florida who scored two or more years below their grade level in reading and found that 70% of the population preferred sensing.[24]

Citing the Tillman article, Farrell (1976) posed several possible reading programs which would take advantage of the different student types.[25]

Smith, Irey, and McCaulley (1973) found that intuitives preferred self-paced instruction and felt that they did their best work when they worked independently of others. Sensing types, on the other hand, felt that individualized or self-paced instruction was dehumanizing and impersonal and they did not feel that they did their best work in courses where they were left to work by themselves.[26]

Following up on this study Smith and Irey, using MBTI theory, designed 20 modules for a college thermodynamics course--six of which were designed for sensing students, twelve for intuitive students, and two on which no prediction was made. They reported that the data provided "overall support for our major hypothesis that student type is related to student curriculum and instructional experiences . . . findings of the study are consistent with theory. Sensing types apparently do dislike new or abstract problems unless there are standard ways to solve them. They also seem to prefer established routine, are patient with learning activities that focus on detail, and do well at precise work. Intuitive types seem to like solving new problems; problems that focus on the world of ideas. They dislike repetition and grow impatient with college teaching that focuses on routine details or requires a lot of precision."[27]

The importance of type difference seems to lie with the student and the way the material is presented rather than in the student-teacher type similarity or type match. A study by Garrison (1970) had shown no relationship between grades given by teachers and the type relationship with students receiving the grades.[28] A similar result was cited by Davis (1969) in his study of teacher-interns and their cooperating teachers when they were requested to rate each other.[29]

Strictly controlling for strength of preference, Weychert (1975) concluded that "classification of teacher type, student type and sex . . . indicated that when considered alone or in interaction they were not as powerful an influence on student achievement (course grade) as originally hypothesized."[30]

A similar finding was reported by Hurst (1976). It was found that "similarity of MBTI types of students and instructors exerted no significant effect on course grades although student type examined independently did demonstrate a significant difference."[31]

Oakland Cognitive Style Map (OCSM)

There are several branches of research in the field of cognitive style. The one related to this study began with the work of Dr. Joseph E. Hill, president of Oakland Community College in Bloomfield Hills, Michigan. Hill put into practice his theories concerning cognitive style and design a "Personalized Educational Program - PEP" at Oakland.

Unlike many cognitive style theorists, Hill looked at learning style as a multifaceted series of twenty-seven elements which interacted with each other within three strata (symbols, cultural determinants, and modalities of inference).[32]

In the first set of symbols, Hill defines two major categories:

> The theoretical symbol is that symbol which presents to the awareness of the individual something different from that which the symbol itself is.
>
> The qualitative symbol is that symbol which presents and then represents to the awareness of the individual that which the symbol itself is to that individual.[33]

Thus the word "house" is a theoretical symbol because the word represents the idea rather than the object, whereas, the sight of the building, or the feel of the material it is made of, is the qualitative symbol. The former usually has a generally agreed upon connotation, while the latter is subjective in nature.

The theoretical symbols can be divided into four elements.

Table 2
Theoretical Symbols

	Auditory	Visual
Linguistic	Auditory Linguistic T(AL)	Visual Linguistic T(VL)
Quantitative	Auditory Quantitative T(AQ)	Visual Quantitative T(VQ)

The spoken word is an example of T(AL) while a written word is an example of T(VL). Similarly, the spoken number is an example of T(AQ) while a written number is an example of T(VQ).

Hill has divided the qualitative symbols into fifteen elements: 1) auditory (A), 2) olfactory (O), 3) savory (S), 4) tactile (T), 5) visual (V), 6) proprioceptive (P), 7) Code Empathetic (CEM), 8) Code Esthetic (CES), 9) Code Ethics (CET), 10) Code Histrionics (CH), 11) Code Kinesics (CK), 12) Code Kinesthetics (CKH), 13) Code Proxemics (CP), 14) Code Synnoetics (CS), 15) Code Transactional (CT).

The second set concerns the cultural determinants of the meaning of symbols. This set is the filter of the theoretical and qualitative symbols and affects the interpretation of these symbols. This results from the fact that humans are social animals and, as such, their perceptions affect and are affected by culture. Hill suggests that certain roles in a person's life will have more influence upon an individual than others. The roles of major influence are those of 1) associates (A), 2) family (F), and 3) individuality (I). "The relative strength (of the cultural determinants) tends to vary with the age of the person and the symbolic condition of the task."[35]

The third set is referred to as the modalities of inference. This set concerns the process of drawing a conclusion and the conclusion itself.[36] Therefore, this set also affects the interpretation of human symbols.

Hill described two broad areas of inference: deductive and inductive. Hill sees the deductive inferential process as being limited.

> Although this type of inferential process is necessary to use when the individual is confronted with certain types of educational tasks such as proving a theorem in geometry, the assumption is generally accepted that these processes are required, and/or employed relatively infrequently in daily living. Less emphasis has been placed, therefore, upon the study of deductive inference processes than upon those efforts designed to yield information about inductive inference processes.[37]

Hill decided that if a conclusion is not directly or logically implied then it must be a probablistic nature and be classified as an inductive inference. Hill used a six-step process of statistical inference as a model of four types of inductive modalities of inference.

1. The hypothesis advanced for testing;

2. The acceptable amount of risk for making either a) the error of rejecting a true hypothesis, or b) accepting a false hypothesis;

3. Calling upon a universe for samples of experiences that seem to pertain to the world referred to in the advanced hypothesis;

4. Defining the critical regions of the universes of experience being employed by establishing limits beyond which, if the information yielded by the observations comprising the sample occurs, the hypothesis must be rejected;

5. Calculating the values of the variables involved from the information provided by the observations comprising the samples being employed;

6. Making the decision to accept or reject the hypothesis.[38]

The model lends itself to the testing of only three types of hypothesis which are called:

> Magnitude (M)--the process of using norms or categorical classifications to define objects in order to understand them.
>
> Difference (D)--the process of reasoning in terms of one-to-one contrasts or comparing selected characteristics.
>
> Relationship (R)--the process of synthesizing and discovering component parts through analysis of a situation.

However, this leads to the creation of a fourth type of inference, appraisal (L). This inference involves the consideration of the other three types of hypothesis, each being an equal weight in the decision, "in the process of drawing a probability conclusion of evaluation regarding the situations and/or phenomena under study."[39]

Hill also included a fourth set entitled, "Neurological, Electrochemical, and Biochemical Aspects of the Memory Functions." Hill saw this set as an important part of his theory and stated that "If communication between these academicians (brain pattern researchers) and educators is to be productive, the educator will need a conceptual framework and language capable of interpreting for use in his field such items as memory stimulators, chemical increases of attention span, and protein inhibitors."[40] However, most cognitive style researchers have omitted this set and concentrated on the first three as a basis for their findings. Bass (1972) said of this set, "This is an educational science which is not well developed. A great deal is not known in this area and although research is being conducted in the area this science is virtually not utilized in the Oakland Community College program."[41]

There are, in actuality, two instruments which are used in the assessment of cognitive style. First the original produced by Hill which is made up of ten sub-tests and requires actual student performance of certain physical aptitudes as well as paper-and-pencil tests. The second battery was constructed by three of Hill's doctoral graduates; Svagr, Zussman, and Fragale. This battery was entitled The Oakland Cognitive Style Interest Inventory and is a paper-and-pencil self-report test. This latter measurement was the one used by this researcher. However, this research of literature reports findings from both of the above instruments and differentiates the source of each set of data. Further discussion of the two instruments can be found in CHAPTER III.

Using Hill's ten sub-test cognitive style battery, Blanzy (1970) examined the relationship between achievement of students in mathematics and certain elements of their cognitive style. He determined that students whose performance goals would place them in the upper 27 percent of their class had an identifiable "collectable cognitive style" that was opposite of the style of those students who ranked below the 27 percent level. It was found that those students who recorded a style with a T(VL)--theoretical visual linguistic element and an I--individuality element made significant gains in achievement when using programmed instructional materials when compared with those students who did not record both or either of these elements.[42]

Strother (1973) employed the OCSM Interest Inventory in a study of a college class utilizing a didactic film. He found that those students who recorded a major T(AL)--theoretical auditory linguistic--made significant gains in achievement over students who possessed a major T(VL)--theoretical visual linguistic. The high achievers also possessed majors in the I--individuality and R--relationship elements.[43]

However, Hand (1972), using programmed instructional materials in a college life science course with the Hill battery,[44] and Brose (1974), using a videotape instruction package in an educational media competency program in conjunction with the OCSM Interest Inventory,[45] found no significant differences in achievement gain or learning time between students who were matched and non-matched.

In studies relating to the influence of style and student-teacher relationships several studies with consistent results have been found.

Schroeder (1969), using the Hill battery, compared the cognitive style of 118 high school English students and their teacher. He reported:

> students rating the teacher high in effectiveness tended to a statistically significant degree (.05) to be students having cognitive styles "similar" to that of the teacher. Students having "similar" cognitive styles also tended to be the students who received the highest grades.[46]

Wasser (1969), using the Hill battery, investigated the cognitive styles of elementary teachers and their students. He found that "the data indicate that a teacher's system of appraising student performance in mathematics, language, health, science, and social studies may depend, in part, upon the similarity of elements comprising their cognitive styles."[47]

McAdam (1971), using the Hill battery, mapped students enrolled in a general education curriculum at Oakland Community College. The Foundation Studies Communication 150 class formed his experimental population. Looking at student acceptance of the course, he reported that "persons in the sample group with a cognitive style that 'matched' that of the teacher, expressed a positive attitude about the instructional experiences and activities in which they were involved during the fifteen week session."[48] Non-matched students, he continued, were "not turned on" by the class.

In a study of nursing, Lange (1972), using the Hill battery, also found that there was a significant relationship between course grade and the number of commonly held cognitive style elements of the student and teacher. The study was also looking at drop-out behavior in the nursing program. It was learned that this, too, was affected by the cognitive style match. An interesting side issue was noted in the study: after the instructors were made aware of the presence of cognitive style, there was an increased tolerance for student behaivor which would have been criticized in the past.[49]

Summary

This review of literature has attempted to present the theories of two individual men who were the prime developers of the concepts under study in this dissertation. Using their original writings, an understanding is sought for the principles at work in the instruments used to measure the types and styles of the students involved in this study.

It was noted, while examining academic differences and MBTI preferences, that there was no significant relationship between the teacher evaluation of the student and the student-teacher match or non-match. The opposite was found to be true when examining the OCSM literature.

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CHAPTER III

METHODOLOGY OF THE STUDY

This study investigated the possible relationship of personality types as measured by the Myers-Briggs Types Indicator (MBTI), and cognitive styles, as measured by the Oakland Community College Cognitive Style Interest Inventory (OCSM). Data for the study were taken from a group of students who were enrolled in a science class entitled "Aviology" which was being field tested throughout the state of Florida.

Population

The sample for this study was drawn from 321 Aviology students who were enrolled in nine schools, located in the state of Florida, during the 1975-76 academic year. In the fall of that year all the participating students were given the MBTI and the OCSM Interest Inventory. One class was selected from Osceola High School, Suncoast High School, Hialeigh High School, Melbourne High School, Lakewood High School, Lake Brantly High School, P.K. Yonge High School, and Palm Beach Junior College. Two classes were included from St. Petersburg Junior College because the "Aviology" course offered as a semester course and there were two different populations to draw from during the 1975-76 academic year. The total number of students in the sample was 172. The average number of students per school was 19; the mode was 21. St. Petersburg Junior College supplied the most with 42 students and Palm Beach Junior College provided the least with five students.

Table 3
MBTI Breakdown of Population Sample

(E) Extraversion	- 87 students	(I) Introversion	- 85 students
(S) Sensing	- 109 students	(N) Intuition	- 63 students
(T) Thinking	- 77 students	(F) Feeling	- 95 students
(J) Judgment	- 80 students	(P) Perception	- 92 students

The resulting combinations of the above preferences would be ploted on a type table as follows.

Table 4
MBTI Type Table

ISTJ - 14	ISFJ - 14	INFJ - 7	INTJ - 6
ISTP - 11	ISFP - 15	INFP - 11	INTP - 7
ESTP - 9	ESFP - 18	ENFP - 11	ENTP - 10
ESTJ - 14	ESFJ - 14	ENFJ - 5	ENTJ - 6

These MBTI preferences could then be broken down into the following combinations.

Table 5
MBTI Preference Combinations

IJ - 41	EP - 48	ST - 48	NF - 34
IP - 44	EJ - 39	SF - 61	NT - 29
SJ - 56	NP - 39	TJ - 40	FP - 55
SP - 53	NJ - 24	TP - 37	FJ - 40
	IN - 31	IS - 54	
	EN - 32	ES - 55	

Distribution of the students according to the OCSM categories requires a prior judgment as to what scores constitutes a major and minor in each element. In 1971, Hill defined a major orientation in this sentence: "If the percentile rank of an individual's score in a given element in the array of values ranging from the fiftieth through the ninety-ninth percentile (inclusively) of a population of these scores, then the individual is accorded a major orientation."[1]

In 1972, with Hill acting as statistician, Bass published the following definition in his dissertation: "Major Orientation--when a student scores in the top 25% on a test for a particular element in cognitive style he is said to have exhibited a major orientation in that element."[2]

Picking a middle ground between Bass and Hill I selected the top 27 percent as my criteria for a major orientation for each cognitive style element.

Using the figure .27 and multiplying it by 40, the maximum score of the OCSM, the result is 10.8 which has been rounded off to the score of 11. Therefore, a score of 29 - 40 was given the title of a major orientation.

The number of students in the sample of 172 who scored majors in the 27 OCSM elements are as follows.

Table 6
Twenty-seven OCSM Elements

T(AL) - 91
T(AQ) - 16
T(VL) - 66
T(VQ) - 105

Q(A) - 87
Q(O) - 119
Q(S) - 96
Q(T) - 89
Q(V) - 107
Q(P) - 74
Q(CEM) - 65
Q(CES) - 85
Q(CET) - 34
Q(CH) - 32
Q(CK) - 64
Q(CKH) - 133
Q(CP) - 92
Q(CS) - 59
Q(CT) - 69

A - 67
F - 32
I - 85

L - 113
D - 118
M - 100
R - 89
K - 67

Instrumentation

Myers-Briggs Type Indicator Construction

The MBTI is a forced choice questionnaire. Form F was used in this study. It consists of 71 choices between two or three phrases or sentences, 52 choices between two words to determine which appeals more, and 43 choices between an additional series of two or three phrases or sentences. The scoring results in a type analysis which indicates the individual's preferences for the different attitudes and functions that are represented in Jung's personality theory that was previously described in CHAPTER II.

Description of the test theory and performance information is contained in a booklet published by the Educational Testing Service entitled simply the Manual, 1962. (Now published by Consulting Psychologists Press, 1975.) Using the logically-split-half procedure, a table on page 19 of the Manual indicates the reliabilities found by applying the Spearman-Brown prophecy formula to obtain correlations between halves. The data were obtained from ten different samples that totaled 727 subjects. The sample included a wide range of age, intellectual ability, and socio-economic status. Myers points out that "the only coefficients below .75 are for the under-achieving 8th grade and the non-prep 12th . . . The possibility would seem to exist that the relative uncertanity on TF may reflect a lesser development of the judging process, which may prove to be a significant characteristic of such samples."[3] However, it is noted by Norman Sunberg, writing in Buros' Sixth Mental Measurements Yearbook, that other personality inventories which use the TF index likewise show the same lower figures on internal consistency and this indicates that the TF type indices tend to be less reliable than the others.[4] This variance of the TF scale showed up again in a fourteen-month test-retest study on stability conducted by Lawrence J. Stricker and John Ross. Their data revealed correlations of approximately .70 for EI, SN, and JP scales and .48 for the TF scales.[5]

Myers devotes six pages of the Manual to criterion related validity. She does this to answer critics who have indicated doubt that her instrument is measuring the variables that Jung had identified.

The first instrument used for comparison was the Grey-Wheelwright Psychological Type Questionnaire. It was developed in California at about the same time that Myers was working on the MBTI in Pennsylvania. Although both used Jung's theory as the basis for their psychological indicators, neither knew of the other's existence until they were published. Although published without a JP scale, the other scales of the Grey-Wheelwright inventory show correlations of .79, .58, and .60 for the EI, SN, and TF respectively. Myers points out that Guilford compared the two inventories and stated, "One should conclude that one has in X and Y essentially two forms of the same test."[6] Myers tartly adds that to view the two inventories as invalid "It must be assumed that not only did the authors of the Indicator (MBTI) miss their objective (of measuring Jung's theory) but also did the Jungian analysts Grey and Wheelwright in exactly the same ways, a coincidence which seems highly unlikely."[7]

The second instrument compared with the MBTI was that of the Strong Vocational Interest Blank. In an analysis performed by Stricker and Ross on 727 Stanford male freshmen, it was found that of the 180 correlations made, 103 were significant beyond the .01 level.

A third study was a correlation with the Allport-Vernon-Lindzey Study of Values. Both inventories were administered to 1371 freshmen at three eastern colleges. Of the 24 correlations, two-thirds were found to be significant at the .01 level.

The fourth study involved the Edwards Personal Preference Schedule. Of the 60 correlations made, 24 were found to be significant at the .01 level.

The last study mentioned was that of the Personality Research Inventory. "For a class of 507 Cornell freshmen engineers, all 25 scales of the PRI correlate significantly with one or more of the type indices . . ."[8]

Just to prove her point, Myers proceeds to correlate the MBTI with numerous other non-test variables which takes an additional 23 pages of charts and explanations. In all, Myers reports MBTI findings on 8,561 individuals in the Manual.

Oakland Cognitive Style Map Interest Inventory Construction

Consurrent with his theory development, Hill devised a diagnostic test battery to categorize individual students for placement into specialized programs. The items developed at Oakland Community College came directly from Hill's writings and other measures including the Gates Reading Tests, the Differential Aptitude Test, the Iowa Tests of Educational Development, the Mueller Auditory Test, the Notus Pattern Test, the Raven Matrices Survey, and the Science Research Associates Batteries. The ten sub-tests developed from the above measures are as follows.

Table 7
Hill OCSM Sub-tests

	Test	Timing
Test 1	Differential Aptitude Test (Verbal Reasoning)	25 minutes
Test 2	Short Story on Tape	5 minutes
Test 3	Differential Aptitude Test (Written Mathematics)	25 minutes
Test 4	Nelson-Denny (Form B) Reading Test	30 minutes
Test 5	Short Story Mathematics	8 minutes
Test 6	English Placement Test	40 minutes
Test 7	Qualitative Codes Test	untimed
Test 8	Qualitative Codes Test	untimed
Test 9	Cultural Determinants Test	untimed
Test 10	Modalities of Inference Raven Matrices Mueller Auditory Olfactory Cards	untimed 8 minutes 8 minutes untimed

The OCSM Interest Inventory, a paper-and-pencil self-report instrument, was originally developed by Svagr, Zussman, and Fragale in order to map the cognitive styles of the administrative staff at Oakland Community College. The first form of this inventory was a package of cards which related to the first three sets of the Educational Sciences. Through the Q-sort process, the cognitive style of the individual was established.

The authors of this inventory then refined it into a questionnaire. (This Interest Inventory is presented in Appendix A.) It consists of 216 sentences which students can label as situations which they can "usually", "sometimes", or "rarely" identify as applying to themselves. Each of the 27 elements has eight situational sentences. The scoring of these sentences results in the categorizing of the students as possessing a major, minor, or negative cognitive style of each particular element. These elements are then combined to produce an overall cognitive style map to be used in the instructional assignment of the student.

This researcher found it very difficult to locate a central source for computation of data which would indicate the reliability and validity of the two cognitive style measures of Oakland Community College. The dissertations referred to in this research of literature were examined for supporting data; however, none were found. This researcher was then directed to the following three dissertations of Crowe, Bartman, and Lipson as sources of the required data. While all three dissertations reported reliability and validity data, all three also carried disclaimers concerning the data since the reported samples were not large enough to be considered as representative of the population as a whole.

Crowe used the Hill test which consisted of the ten sub-tests. Crowe stated that:

> "The validity and reliability of the Oakland College Cognitive Style Tests and Inventory Battery are sufficient for purposes of the present study. The battery is discussed and considered in Chapter III in terms of the results yielded on the subjects included in the samples employed in the study. Put in another way to spend a great amount of space and time regarding these matters at this point could lead to digression and misinterpretation of the main study effort. Coefficients, and other information pertaining to these matters, yielded by the Battery on subjects included in the study will be provided."[9]

She adds, "Since the present study is exploratory in nature and is thus not concerned with collecting a large number of cases for the purpose of statistical validation, the size of the sample employed can be relatively small . . ."[10] (The sample consisted of 17 males and 17 females.) Commenting on reliability Crowe states, "The Kuder-Richardson formula was used to determine the value of the reliability coefficient, r_{xx}. Utilizing a data processing program at Oakland Schools a reliability coefficient of .81 was determined."[11] The dissertation did not include the figures which went into this computation.

Crowe explains her validity data as follows: (It should be noted that in this quote Crowe discusses twenty sample subjects. This is the figure used in the Garrett reference on which she is basing her explanation of the statistical method used. Her final computations were based on the reported sample of 34.)

"Although a number of statistical methods have been devised for use in determining the discriminative power of anitem (e.g., phi coefficient), the use of the biserial correlation coefficient (Garrett, 1958, p. 375) is usually regarded as the standard procedure in item analysis. The value of the biserial r shows the correlation of an item with total scores on the test, or with scores on some independent criterion. The adequacy of other methods, most of them being summary in nature, is judged on the basis of the degree to which they yield results that approximate those obtained by the 'biserial' method.

Garrett (1958) outlines a method for determining the discriminative power of an item (validity index), which he describes as 'much favored' by test constructors, and 'one of the best among several methods.' The procedure, somewhat modified in terms of the number of examinees employed, and in the descriptions associated with each step is as follows:

Step 1 Given twenty sample subjects with cognitive style maps, arrange the 'maps' in descending order of the test or inventory scores under consideration, i.e., place the map with the highest score at the top, and the one with lowest score at the bottom of the pile.

Step 2 According to Flanagan's technique, count off the top 27% of the test scores (since n = 20, count off the top five), and the bottom 27%, i.e., the bottom 5 maps. It should be emphasized here that Flanagan has 'proved' that the discriminative power of an item is most accurately determined when item analysis is based on the top and bottom 27% of the distribution, respectively, rather than any other percent of the respective ends of the distribution.

Step 3 Disregard the ten maps associated with the 'middle' of the distribution of scored maps.

Step 4 Count the number in the top group who responded 'correctly,' i.e., orientation of elements to the item being analyzed; and the number in the bottom group, who responded 'correctly.' Convert these numbers to percents. For example, if 4 of the 5 students in the top group responded correctly to the item, the percent would be: 4/5 = .80.

Step 5 Employing (Flanagan's table listed below) along with the value of percent of the respective group, i.e., 'top' and 'bottom,' the approximate value of the biserial r (the discriminative index or the validity index for the item) may be found in the cell formed by the intersection in the appropriate column and row. For example, suppose the percent of correct responses for the upper group was: 90, and for the lower group was: 30, the value of the discriminative index or validity index would be: $r_{bis} = .63$.

FLANAGAN'S TABLE OF NORMALIZED BISERIAL COEFFICIENTS

PROPORTION OF CORRENT RESPONSES IN THE UPPER 27 PER CENT

02	06	10	14	18	22	26	30	34	38	42	26	50	54	58	62	66	70	74	78	82	86	90	94	98	PROPORTION OF CORRECT RESPONSES IN THE LOWER 27 PER CENT
00	19	30	37	43	48	51	55	58	61	63	66	68	70	72	73	75	77	79	80	82	84	86	88	91	02
	00	11	19	26	31	36	40	44	47	50	53	56	59	61	64	66	68	71	73	76	78	81	84	88	06
		00	08	15	21	26	30	34	38	41	45	48	51	54	57	60	63	65	68	71	74	77	81	86	10
			00	07	12	18	22	27	31	34	38	42	45	48	51	54	57	60	63	67	70	74	78	84	14
				00	06	11	16	20	25	28	32	36	39	43	47	49	53	56	60	63	67	71	76	82	18
					00	06	10	15	19	23	27	31	34	38	42	45	49	52	56	60	63	68	73	80	22
						00	05	09	14	18	22	26	30	33	37	41	44	48	52	56	60	65	71	79	26
							00	04	09	13	17	21	25	29	33	37	40	44	49	53	57	63	68	77	30
								00	04	09	13	17	21	25	29	33	37	41	45	49	54	60	66	75	34
									00	04	08	13	16	20	25	29	33	37	42	47	51	57	64	73	38
										00	04	08	12	16	20	25	29	33	38	43	48	54	61	72	42
											00	04	08	12	16	21	25	30	34	39	45	51	59	70	46
												00	04	08	13	17	21	26	31	36	42	48	56	68	50
													00	04	08	13	17	22	27	32	38	45	53	66	54
														00	04	09	13	18	23	28	34	41	50	63	58
															00	04	09	14	19	25	31	38	47	61	62
																00	04	09	15	20	27	34	44	58	66
																	00	05	10	16	22	30	40	55	70
																		00	06	11	18	26	36	51	74
																			00	06	12	21	31	48	78
																				00	07	15	26	43	82
																					00	08	19	37	86
																						00	11	30	90
																							00	19	94
																								00	98

> In the following the steps outlined above for the twenty sample subjects, the following validity index was found for each element:
>
> T(AL): $r_{bis} = .84$
> T(VQ): $r_{bis} = .93$
> T(AQ): $r_{bis} = .93$
> T(VL): $r_{bis} = .77$
> Q(CEM): $r_{bis} = .77$
> Q'(CES): $r_{bis} = .93$
> Q(CET): $r_{bis} = .84$
> Q'(CH): $r_{bis} = .93$
> Q'(CK): $r_{bis} = .84$
> Q'(CKH): $r_{bis} = .68$
> Q(CP): $r_{bis} = .68$
> Q(CS): $r_{bis} = .84$
> Q'(CT): $r_{bis} = .84$
> I: $r_{bis} = .93$
> A': $r_{bis} = .54$
> F': $r_{bis} = .54$
> M': $r_{bis} = .68$
> D': $r_{bis} = .54$
> R': $r_{bis} = .68$
> L: $r_{bis} = .93$
>
> The average validity for the battery was r_{bis} - .783."[12]

Bartman, using Hill's battery of ten sub-tests on an eleventh grade class of thirty-three, also stated that his study "was exploratory and hypothesis generating in nature" and "not concerned with collecting a large number of cases for the purpose of statistical validation."[13] He then related the following: "The Kuder-Richardson formula twenty was used to determine the data processing program at Oakland Schools, the reliability coefficient of .96 was determined."[14] Employing the same method of item analysis as Crowe, Bartman reported the following validity data:

> ". . .the following validity index was found for each element in the sample n = 33 used in this study:
>
> T'(AL): $r_{bis} = .64$
> T(VQ): $r_{bis} = .61$
> Q(CP): $r_{bis} = .90$
> Q(CS): $r_{bis} = .94$

T(AQ): $r_{bis} = .94$

T(VL): $r_{bis} = .94$

Q(CEM): $r_{bis} = .87$

Q'(CES): $r_{bis} = .88$

Q(CET): $r_{bis} = .94$

Q'(CH): $r_{bis} = .87$

Q'(CK): $r_{bis} = .94$

Q'(CKH): $r_{bis} = .94$

Q'(CT): $r_{bis} = .94$

I: $r_{bis} = .61$

A': $r_{bis} = .94$

F': $r_{bis} = .60$

M': $r_{bis} = .76$

D': $r_{bis} = .79$

R': $r_{bis} = .79$

L $r_{bis} = .60$

The average validity for the batter was $r_{bis} = .82$."[15]

Lipson used the OCSM Interest Inventory in a study of an eighth grade social studies class of twenty-one, however only seventeen of the students completed the instruments used in the study. Lipson states, "Since the intent of this study was exploratory, a sample size of thirty or less was deemed to be adequate."[16] He then explained that "the value of the Kuder-Richardson reliability coefficient was calculated by the Computation Center of the Oakland County Intermediate School District. . .the value of the reliability coefficient for the Oakland Community College Interest Inventory. . .was found to be: $r = .70$."[17]

Using the same computational method as Crowe and Bartman, Lipson reported the following validity data:

> "The validity indices (point biserial correlation coefficients) for each of the elements included in the Oakland Community College Interest Inventory are:

1) T(VL): $r_{bis} = .67$

2) T(AL): $r_{bis} = .93$

3) T(VQ): $r_{bis} = .54$

4) T(AQ): $r_{bis} = .67$

5) Q(CEM): $r_{bis} = .93$

6) Q(CES): $r_{bis} = .93$

7) Q(CET): $r_{bis} = .93$

8) Q(CH): $r_{bis} = .84$

9) Q(CK): $r_{bis} = .77$
10) Q(CKH): $r_{bis} = .93$
11) Q(P): $r_{bis} = .93$
12) Q(CS): $r_{bis} = .77$
13) Q(CT): $r_{bis} = .77$
14) I: $r_{bis} = .93$
15) A: $r_{bis} = .93$
16) F: $r_{bis} = .93$
17) M: $r_{bis} = .93$
18) D: $r_{bis} = .93$"[18]

This author was able to locate one complete study which reported reliability and validity data for the Oakland Community College Interest Inventory.

This study, using the OCSM Interest Inventory, was conducted by Richard E. Heun, Linda R. Heun, and R. V. Schnucker, faculty members of Northeast Missouri State University. The study involved 51 students who were enrolled in the LL 170 Speech Communications class and 20 students who were enrolled in the SS 12-121 World Civilization class during the fall semester of 1974, at Northeast Missouri State University. Using the Hill procedure described in the chapter of the Educational Sciences manuscript entitled "Problem Set on the Reliability of Mapping 'Style' Elements," Heun et. al., employed the concept of domain sampling and the method of inter-correlations among items. "Reliability was computed using the Kuder-Richardson - 20 formula, the split-half correlation approach and the standard error of measurement."[19]

The population used in this study was composed of 49 freshmen, 18 sophomores, and four juniors. As an experimental population, the range of ages and educational levels of the subjects was small. Therefore, Heun concluded that it would be necessary to compute an estimated reliability figure for the entire population set of post-high school individuals. Heun's assumption was based upon the following statement from Hill.

> "Although this condition, estimating reliability of an instrumentality administered to a group of narrow range from data yielded by the instrumentality when administered to a group reflecting a much greater range, is the one usually found to exist, it is possible, providing the assumption of equal effectiveness can be made, to estimate the value of the reliability coefficient for the wide range group from data yielded by a group showing a narrow range of development in the dimensions covered by the instrumentality."[20]

Heun estimated "that the wide range standard deviation of the entire population for all post-high school people would be at least twice as large as the standard deviation of the subjects studied."[21]

The estimated reliability coefficients were derived using the following formula from Hill:[22]

$$\frac{S_n}{S_w} = \frac{\sqrt{1 - r_{ww}}}{\sqrt{1 - r_{nn}}}$$

where S_n represents the standard deviation of the narrow population (Heun's population of 71)

where S_w represents the standard deviation of the wide or estimated population (Heun's population of post-high school people)

where r_{ww} represents the reliability coefficient of the wide population

where r_{nn} represents the reliability coefficient of the narrow population.

For example, using Table No. 10, Appendix B, the element T(AL) has a standard deviation of 5.1229 which is S_n. Assuming that the standard deviation is at least twice as large for the post-high school population, S_w can be represented by 2 x 5.1229 or 10.2458. Using Table No. 11 in Appendix B, the reliability coefficient calculated by the Kuder-Richardson

20 formula for the narrow population or r_{nn} is .313. Substituting these values into the Hill formula:

$$\frac{5.1229}{10.2458} = \frac{\sqrt{1 - r_{ww}}}{\sqrt{1 - .313}}$$

Reducing the fraction $\frac{5.1229}{10.2458}$ to its simplest form yields the fraction 1/2.

Therefore: $$1/2 = \frac{\sqrt{1 - r_{ww}}}{\sqrt{1 - .313}}$$

$$1/2 = \frac{\sqrt{1 - r_{ww}}}{\sqrt{.687}}$$

$$1/2 = \frac{\sqrt{1 - r_{ww}}}{.829}$$

By cross multiplication:

$$.829 = 2\sqrt{1 - r_{ww}}$$

Dividing by 2:

$$\frac{.829}{2} = \frac{2\sqrt{1 - r_{ww}}}{2}$$

$$.414 = \sqrt{1 - r_{ww}}$$

Squaring both sides:

$$.172 = 1 - r_{ww}$$

$$r_{ww} = 1 - .172$$

$$r_{ww} = .829$$

as represented in Table No. 14 in Appendix B as the estimated reliability coefficient of element T(AL).

According to Table No. 14, the estimated reliability coefficients for the remaining elements range from a low of .764 (F) to a high of .938 (M).

The Heun study used the concept of domain sampling in the validity correlation. "Also the criterion skill tests were created independently from the CSM items and elements and both were reliable. Internal validity was computed by correlating the item gain scores with the element total gain scores."[23] The internal validity scores ranged from a low of .379 for element T(VQ) to a high of .737 for element Q(CES). (See Appendix B, Table No. 12.)

External validity was calculated for a total of five elements. It was computed "by correlation with concurrent skill test gains. Correlations of the element total gain scores correlated with the percentage improvements in the skill test."[24] (See Appendix B, Table 13.) The correlations were not strong.

Estimated validity for the post-high school population was also computed by Heun. "After the estimated edumetric reliability was computed for a doubled standard deviation, the estimated edumetric validity was determined by the relationship, the square of the reliability coefficient was equal to or greater than the validity coefficient."[25] Heun then calculated the estimated validity coefficient for each of the 27 elements by squaring the estimated reliability coefficient for each element. (See Appendix B, Table No. 14.)

Another study was conducted as part of the ESEA Title IV-C Project in the Duval County Public Schools of Jacksonville, Florida. The author contacted the supervisor of this project and received reliability and validity data which were collected in conjunction with the study. The data received are contained in Appendix C. The information is incomplete due to the fact that only the resulting coefficients are presented along with the number of participants involved in each experimental group. The method of data analysis is not available in the report. The selection and composition of the specific groups used in the reliability and validity portion of this study is not made specific. When the author contacted the supervisor she was unable to provide any furhter information concerning the reliability and validity data. Therefore, the coefficients contained in Appendix C are provided for comparison study.

Additional coefficients concerning reliability and validity are contained in two letters, copies of which are located in Appendix D. However, due to lack of information concerning the methods used in gathering the data, these letters are presented for comparison only.

In the literature located, it should also be noted that only five of the 27 elements composing the cognitive style of Hill were subjected to a study of external validity. The resulting coefficients reported in Appendix B, Table No. 13 were very low. This researcher has pursued all possible avenues to locate any further supporting data.

Data Collection

The MBTI and the OCSM were administered to 280 students in nine schools in September, 1975, and to 41 students at St. Petersburg Junior College in February, 1976. One teacher at each school administered the MBTI and the OCSM during one week of classes allowing one class day between each inventory. All inventories were scored and returned to the teachers for distribution to the students. A class was selected from each participating school to be included in the correlational analysis. The same procedure was repeated in February when the second class from St. Petersburg Junior College was added to the sample population.

Design

This dissertation involves a correlational analysis of a personality instrument and a cognitive style instrument. Product-moment correlation coefficients were calculated. Hypotheses as to what correlations might be found were theoretical constructs of the instruments used.

The primary strength of the correlational approach "is that it permits measuring a number of variables and their interrelationships simultaneously."[26] However, Borg warns that this advantage can be misused by simple "administering very large numbers of measures in hopes that some of the measures administered will turn out to be related to the behavior studies."[27] By employing hypotheses to predict certain relationships, this author sought to heed the warning made by Borg.

Hypotheses Generation Methodology

Using the generalizations found in the literature, each of the OCSM elements was analyzed as to its probable theoretical match to one or more of the MBTI dimensions. The resulting 35 theoretical matches are the hypotheses of the study. This researcher, presuming his knowledge of OCSM constructs to be adequate to represent Hill's theory with reasonable accuracy, discussed each OCSM element with Dr. Mary McCaulley, an authority on the MBTI. The 35 hypotheses were generated in that meeting.

Hypothesis 1

> There is predicted to be a positive relationship between the OCSM element Theoretical Auditory Linguistic and the MBTI attitude Extraversion.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Theoretical Auditory Linguistic is one who listens well when participating in discussions, can give directions orally, and can describe things verbally. A person who prefers the MBTI attitude Extraversion is one who generally seeks out opportunities to talk with people and usually communicates well.

Hypothesis 2

> There is predictee to be a positive relationship between the OCSM element Theoretical Auditory Linguistic and the MBTI function Intuition.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Theoretical Auditory Linguistic also can be described as one who understands oral directions, remembers information told, and learns by listening to lectures. A person who prefers the MBTI function Intuition can usually organize abstract information and handle more complicated situations.

Hypothesis 3

> There is predicted to be a positive relationship between the OCSM element Theoretical Auditory Quantitative and the MBTI attitude Extraversion.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Theoretical Auditory Quantitative can follow verbal directions using numbers and can work problems which are presented orally. The person who prefers the MBTI attitude Extraversion is inclined to give more attention to oral stimuli than is the person preferring Introversion.

Hypothesis 4

> There is predicted to be a positive relationship between the OCSM element Theoretical Visual Linguistic and the MBTI combination of the attitude Introversion and the function Intuition.

This hypothesis is based upon the theory that a person who has a

major orientation in the OCSM element Theoretical Visual Linguistic learns from reading books and prefers learning from the written word. Persons, who prefer the MBTI combination of the attitude Introversion and the function Intuition often teach themselves to read as young children, and, as a group, score higher on reading tests.

Hypothesis 5

> There is predicted to be a positive relationship between the OCSM element Theoretical Visual Quantitative and the MBTI combination of the attitude Introversion and the function Intuition.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Theoretical Visual Quantitative solves written math problems easily and understands formulas and mathematical information. Persons who prefer the MBTI combination of the attitude Introversion and the function Intuition, as a group, score highest on tests of abstract reasoning and manipulation of abstract symbols.

Hypothesis 6

> There is predicted to be a positive relationship between the OCSM element Qualitative Auditory and the MBTI function Intuition.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Auditory can differentiate between sounds easily and can tell if things sound right. Persons who prefer the MBTI function Intuition tend to be more imaginative than realistic in assessing their own capabilities; hence, they can be predicted to rate themselves highly on a paper-and-pencil estimate of sensory accuity.

Hypothesis 7

> There is predicted to be a positive relationship between the OCSM element Qualitative Olfactory and the MBTI function Intuition.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Olfactory can recognize different smells readily (i.e., in chemistry) and can imagine the dinner menu by the smells from the kitchen. The person who prefers the MBTI function of Intuition likes to use imagination, and to look for imaginative associations to prior experience.

Hypothesis 8

> There is predicted to be a positive relationship between the OCSM element Qualitative Savory and the MBTI function Intuition.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Savory gets meaning through taste (What's in a produce? How was it made? Where did it come from?) and gains meaning through tasting things others would not taste (pieces of wood, pieces of metal, chemicals). The person who prefers the MBTI function of Intuition likes to use imagination, looks for hidden meanings in things, and likes to think up new ways of doing things. In addition, there was a study conducted at Ohio State University in which it was shown that individuals who preferred the MBTI function Intuition were more taste sensitive.

Hypothesis 9

> There is predicted to be a positive relationship between the OCSM element Qualitative Tactile and the MBTI function Intuition.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Tactile is one who gains meaning through the sense of touch and can identify things just through touch. As in the case of Hypothesis 6, person who the MBTI function Intuition can be expected to rate themselves well on self-reports of sensory accuity.

Hypothesis 10

> There is predicted to be a positive relationship between the OCSM element Qualitative Visual and the MBTI function Intuition.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Visual is one who gains meaning well through sight and transfers things he or she sees into other meanings (see water falling, thinks rain). The person who prefers the MBTI function Intuition is one who likes to use imagination and looks for hidden meanings and associations to prior experience.

Hypothesis 11

> There is predicted to be no positive relationship between the OCSM element Qualitative Proprioceptive and any MBTI function or attitude.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Proprioceptive is one who combines two or more senses together without really thinking about it. There is no one MBTI attitude or function which reflects this attribute.

Hypothesis 12

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Empathetic and the MBTI attitude Extraversion.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Empathetic is one who enjoys others and does things because they think someone expects it of them. Persons who prefer the MBTI attitude Extraversion are those who like to have people around and want to know what others expect of them.

Hypothesis 13

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Empathetic and the MBTI function Feeling.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Empathetic is one who can put himself in another's place and is concerned about other people's problems. The person who prefers the MBTI function Feeling is one who is aware of other people's feelings and tends to be sympathetic.

Hypothesis 14

> There is predicted to be no positive relationship between the OCSM element Qualitative Code Esthetic and any MBTI attitude or function.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Esthetic is one who appreciates the beauty of nature, art, music or architecture and can make attractive displays. There is no one MBTI attitude or function that reflects these attributes.

Hypothesis 15

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Ethics and the MBTI attitude Introversion.

This hypothesis is based upon the theory that a person who has a

major orientation in the QCSM element Qualitative Code Ethics is one who is committed to a set of values or duties and works well alone--needs no supervision. The person who prefers the MBTI attitude Introversion is one who sets his or her own standards and works contentedly along.

Hypothesis 16

> There is predicted to be a positive relationship between OCSM element Qualitative Code Ethics and the MBTI function Thinking.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Ethics is one who believes in principles and tells the truth. The person who prefers the MBTI function Thinking is one who wants to be treated with justice and fair play according to principles, and is likely to act on principles when they clash with feelings or sympathies.

Hypothesis 17

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Histrionics and the MBTI attitude Extraversion.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Histrionics is one who speaks up readily in class and enjoys performing before a group. The person who prefers the MBTI attitude Extraversion is one who usually communicates well and is expressive in social situations.

Hypothesis 18

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Kinesics and the MBTI attitude Extraversion.

This hypothesis is based upon the theory that a person who has a

major orientation in the OCSM element Qualitative Code Kinesics is one who communicates through facial expression and gains information through the expressions of others. The person who prefers the MBTI attitude Extraversion is one who usually communicates well and wants to know what others expect of him or her, so is attuned to communication cues.

Hypothesis 19

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Kinesics and the MBTI combination of the functions Intuition and Feelings.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Kinesics is one who uses facial expression to communicate and uses and reads gestures and stances well. The person who prefers the MBTI combination of the functions of Intuition and Feeling is one who has personal warmth, who values that trait in others, and who is alert to subtle indications of values and feelings held by others.

Hypothesis 20

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Kinesthetics and the MBTI function Sensing.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Kinesthetics is one who is good at athletic skills and can copy drawings well. The person who prefers the MBTI function Sensing is one who enjoys physical skills already learned and tends to be good at precise work.

Hypothesis 21

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Proxemics and the MBTI attitude Extraversion.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Proxemics is one who doesn't offend people when approaching them and gets along well in a group. The person who prefers the MBTI attitude Extraversion is one who usually communicates well and likes to have people around.

Hypothesis 22

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Proxemics and the MBTI attitude Perception.

This hypothesis is based upon the theory that a person who possesses the OCSM element Qualitative Code Proxemics is one who picks up clues as to who can or cannot be approached and responds appropriately when approached by teachers. The person who prefers the MBTI attitude Perception is one who is flexible when dealing with unplanned or unexpected happenings and aims to understand and adapt to events.

Hypothesis 23

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Synnoetics and the MBTI function Intuition.

This hypothesis is based upon the theory that a person who has a major orientation on the OCSM element Qualitative Code Synnoetics is one who knows that he or she can do and learns from past experiences. The person who prefers the MBTI function Intuition is one who can see more readily the "big picture" and perceives the meanings and relationships of experiences.

Hypothesis 24

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Synnoetics and the MBTI attitude Judgment.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Synnoetics is one who is self-confident and knows his/her strengths. Persons who prefer the MBTI attitude Judgment are those whose minds are usually made up and are at their best when they can plan their work and follow that plan.

Hypothesis 25

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Transactional and the MBTI attitude Extraversion.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Transactional is one who can sell people on his/her ideas and gets along well in a group. The person who prefers the MBTI attitude Extraversion is one who is good at greeting people and likes to have people around.

Hypothesis 26

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Transactional and the MBTI function Feeling.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Qualitative Code Transactional is one who can get people to work together and can borrow from fellow students without causing any bad feelings. The person who prefers the MBTI function Feeling is one who values harmony and can predict how others will react to certain situations.

Hypothesis 27

> There is predicted to be no positive relationship between the OCSM element Associates and any MBTI attitude or function.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Associates is one who seeks approval of his peers and will let his mind be changed by fellow students. There is no one MBTI attitude or function which reflects these attributes.

Hypothesis 28

> There is predicted to be a positive relationship between the OCSM element Family and the MBTI attitude Extraversion.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Family is one who seeks the support of his family or teacher for his actions. The person who prefers the MBTI attitude Extraversion is one who wants to know what others expect of him or her.

Hypothesis 29

> There is predicted to be no positive relationship between the OCSM element Individuality and any MBTI attitude or function.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Individuality is one who is independent and expects to be considered a leader. There is no one MBTI attitude or function that reflects these attributes.

Hypothesis 30

> There is predicted to be a positive relationship between the OCSM element Difference and MBTI type ENTP.

This hypothesis is based upon the theory that a person who has a

major orientation in the OCSM element Difference is one who disagrees to come to a meaning (argumentative) and could be considered a hell raiser. The person of the MBTI type ENTP (Extraverted-Intuitive-Thinking-Perceptive) is described as one who can always find logical reasons for whatever he or she wants, is alert, outspoken, and will argue either side of a question for the fun of it.

Hypothesis 31

> There is predicted to be a positive relationship between the OCSM element Appraisal and the MBTI function Intuition.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Appraisal is one who considers all angles, wants to know more and more about a subject, and can understand almost any approach. The person who prefers the MBTI function Intuition is one who is patient with complicated situations and likes solving new problems.

Hypothesis 32

> There is predicted to be a positive relationship between the OCSM element Appraisal and the MBTI attitude Perception.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Appraisal is one who is a wheeler-dealer type--changes according to the situation and has difficulty making decisions. The person who prefers the MBTI attitude Perception is one who tends to be good at adapting to changing situations and may have trouble making decisions.

Hypothesis 33

> There is predicted to be a positive relationship between the OCSM element Magnitude and MBTI type ESTJ.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Magnitude is one who wants specific directions and clear-cut answers and is bored by lengthy explanations. The person of the MBTI type ESTJ is one who is a practical realist, is matter of fact, and is not interested in subjects he sees no use for.

Hypothesis 34

> There is predicted to to be a positive relationship between the OCSM element Relationship and the combination of the functions Intuition and Thinking.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Relationship is one who can manipulate multiple relationships and sees how elements are similar by seeking approximations to several other things he already knows. The person who prefers the MBTI combination of the functions of Intuition and Thinking is one who is good at understanding theoretical principles and is skeptical, critical, and logical to the point of hair splitting.

Hypothesis 35

> There is predicted to be a positive relationship between the OCSM element Deductive and the MBTI function Thinking.

This hypothesis is based upon the theory that a person who has a major orientation in the OCSM element Deductive is one who works from the general to specific (logically) and works things out from rules or givens. The person who prefers the MBTI function Thinking is one who likes to decide logically and relies on analysis to solve problems.

Data Analysis

The data analyzed to test the hypothesis were for those students who were selected by class membership. The complete data sets numbered 172.

The analysis of the data was performed in two steps. A preliminary analysis was performed using an SPSS program which yielded a cross tabulation of MBTI type of each of the twenty-seven categories of the OCSM. The data were further broken down by strength of the OCSM category as a major, minor, or negative.

The major scores were then recorded by type and analyzed by the Selection Ration Type Table Program. This program, designed by the personnel of the Center for Applications of Psychological Type (C.A.P.T.) located in Gainesville, Florida, provided information concerning the relationship of each OCSM category with the possible type combinations of the MBTI type table. This table lists the four attitudes of EI, JP; the four functions SN, TF; the combinations of IJ and IP, EP and EJ, ST and SF, NF and NT, SJ and SP, NP and NJ, TJ and TP, FP and FJ, IN and EN, IS and ES, plus the sixteen MBTI types. The resulting information was presented in the form of Chi square calculations or, for smaller cells of data, in the form of Fisher's Exact Probability.

The data were run on the IBM 370/165 computer located at the Northeast Regional Data Center of the State University System of Florida, Gainesville, Florida.

Notes--Chapter III

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CHAPTER IV

ANALYSIS OF DATA

Analysis of Data

Hypothesis 1

> There is predicted to be a positive relationship between the OCSM element Theoretical Auditory Linguistic and the MBTI attitude Extraversion.

To demonstrate the Chi square calculations used to confirm or to deny the hypotheses, the calculations for this first hypothesis will be shown in detail.

The Chi square formula requires both an observed frequency and an expected frequency for each cell of data. The observed frequencies are found in the information gathered in the study. The expected frequencies, however, are produced from a formula utilizing the observed frequencies.

First, it is necessary to calculate the observed frequency for each cell.

Total Population = 172
Sample Population = 91 (Those students who scored a major in T(AL).)
The population
outside the sampel = 81 (Those students who did not score a major in T(AL).)

Total E Population = 87 (All students in the study who selected E.)
Sample E Population = 50 (Extraverted students with a major in T(AL).)
The population of E
outside the sample = 37 (Extraverted students with a major in T(AL).)

Population outside sample = 81
E population outside sample = 37
By subtraction, there are 44 students who are not E and who are outside the sample.

Sample population = 91
Sample E population = 50
By subtraction, there are 41 students who are not E and who are inside the sample.

The next step is to place this information in a matrix of two rows and two columns. Row #1 will be concerned with those students who are Extraverted and row #2 will be concerned with those students who are not Extraverted. Vertical column #1 will be concerned with those students who are outside the sample and vertical column #2 will be concerned with those students who are inside the sample.

Table 8
Table for Observed Frequency (f_o)

	Students Not T(AL)	Students Major T(AL)	TOTALS
Students who are E	37	50	The Sum of $r_1 = 87$
Students who are not E	44	41	The sum of $r_2 = 85$
TOTALS	The sum of $c_1 = 81$	The sum of $c_2 = 91$	Total Population = 172

Utilizing the above information, a table for expected frequency can be constructed by employing the following formulae:

Expected Frequency - f_e #1 (E outside of sample) $= \frac{r_1 c_1}{\text{total population}}$

f_e #2 (E inside of sample) $= \frac{r_1 c_2}{\text{total population}}$

f_e #3 (Not E outside of sample) $= \frac{r_2 c_1}{\text{total population}}$

$$f_e \#4 \text{ (Not E inside of sample)} = \frac{r_2 c_2}{\text{total population}}$$

By substituting the numbers from the table for observed frequency where r represents the sum of the horizontal rows and where c represents the sum of vertical columns, the following calculations are made:

$$f_e \#1 = \frac{(87)\ (81)}{172} = \frac{7047}{172} = 40.97$$

$$f_e \#2 = \frac{(87)\ (91)}{172} = \frac{7917}{172} = 46.02$$

$$f_e \#3 = \frac{(85)\ (81)}{172} = \frac{6885}{172} = 40.02$$

$$f_e \#4 = \frac{(85)\ (91)}{172} = \frac{7735}{172} = 44.97$$

Table 9
Table for Expected Frequency (f_e)

	Students Not T(AL)	Students Major T(AL)	TOTALS
Students who are E	40.97	46.02	r_1 = 86.99
Students who are not E	40.02	44.97	r_2 = 84.99
TOTALS	c_1 = 80.99	c_2 = 90.99	Total Population = 171.98

Having obtained both observed cell frequencies (f_o) and expected cell frequencies (f_e), a Chi square can now be calculated to determine whether or not Hypothesis 1 is confirmed or denied.

Employing the following formula, a calculation is made for each cell in order to determine the Chi square:

$$x^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right]$$

Therefore, by substituting from the above tables, it is found that:

$$x^2 = \frac{(37 - 40.97)^2}{40.97} + \frac{(50 - 46.02)^2}{46.02} + \frac{(44 - 40.02)^2}{40.02} + \frac{(41 - 44.97)^2}{44.97}$$

$$x^2 = \frac{15.76}{40.87} + \frac{15.84}{46.02} + \frac{15.84}{40.02} + \frac{15.76}{44.97}$$

$$x^2 = .385 + .344 + .396 + .350$$

$$x^2 = 1.475$$

The calculated value of Chi square for the combination of the OCSM element T(AL) and the MBTI attitude E was 1.475. This is below the .05 level of significance which is listed at 3.8 with one degree of freedom. The Phi coefficient was .09. Therefore, this hypothesis was not supported.

Hypothesis 2

> There is predicted to be a positive relationship between the OCSM element Theoretical Auditory Linguistic and the MBTI function Intuition.

	Students Not T(AL)	Students Major T(AL)
Students who are N	24	39
Students who are *not* N	57	52

The calculated value of Chi square for this combination was 3.23 and, therefore, this hypothesis was not supported at the .05 level of significance. The Phi coefficient was .14.

Hypothesis 3

> There is predicted to be a positive relationship between the OCSM element Theoretical Auditory Quantitative and the MBTI attitude Extraversion.

	Students Not T(AQ)	Students Major T(AQ)
Students who are E	75	12
Students who are not E	81	4

The calculated value of Chi square for this combination was 4.21 and, therefore, this hypothesis was supported at the .05 level of significance. The Phi coefficient was .16.

Hypothesis 4

> There is predicted to be a positive relationship between the OCSM element Theoretical Visual Linguistic and the MBTI combination of the attitude Introversion and the function Intuition.

	Students Not T(VL)	Students Major T(VL)
Students who are IN	21	10
Students who are not IN	85	56

The calculated value of Chi square for this combination was 0.60. Therefore, this hypothesis failed to be supported. The Phi coefficient was .06.

Hypothesis 5

> There is predicted to be a positive relationship between the OCSM element Theoretical Visual Quantitative and the MBTI combination of the attitude Introversion and the function Intuition.

	Students Not T(VQ)	Students Major T(VQ)
Students who are IN	9	22
Students who are *not* IN	58	83

The calculated value of Chi square for this combination was 1.57. Therefore, this hypothesis failed to be supported. The Phi coefficient was .10.

Hypothesis 6

> There is predicted to be a positive relationship between the OCSM element Qualitative Auditory and the MBTI function Intuition.

	Students Not Q(A)	Students Major Q(A)
Students who are N	29	34
Students who are *not* N	56	53

The calculated value of Chi square for this combination was 0.46. Therefore, this hypothesis failed to be supported. The Phi coefficient was .05.

Hypothesis 7

There is predicted to be a positive relationship between The OCSM element Qualitative Olfactory and the MBTI function Intuition.

	Students Not Q(0)	Students Major Q(0)
Students who are N	14	49
Students who are not N	39	70

The calculated value of Chi square for this combination was 3.44 and, therefore, this hypothesis was not supported at the .05 level of significance. The Phi coefficient was .14.

Hypothesis 8

There is predicted to be a positive relationship between the OCSM element Qualitative Savory and the MBTI function Intuition.

	Students Not Q(S)	Students Major Q(S)
Students who are N	21	42
Students who are not N	55	54

The calculated value of Chi square for this combination was 4.75 and, therefore, this hypothesis was supported at the .05 level of significance. The Phi coefficient was .17.

Hypothesis 9

There is predicted to be a positive relationship between the OCSM element Qualitative Tactile and the MBTI function Intuition.

	Students Not Q(T)	Students Major Q(T)
Students who are N	31	32
Students who are not N	52	57

The calculated value of Chi square for this combination was 0.04. Therefore, this hypothesis was not supported. The Phi coefficient was .02.

Hypothesis 10

There is predicted to be a positive relationship between the OCSM element Qualitative Visual and the MBTI function Intuition.

	Students Not Q(V)	Students Major Q(V)
Students who are N	16	47
Students who are not N	49	60

The calculated value of Chi square for this combination was 6.50 and, therefore, this hypothesis was supported at the .05 level of significance. The Phi coefficient was .19.

Hypothesis 11

There is predicted to be no positive relationship between the OCSM element Qualitative Proprioceptive and any MBTI function or attitude.

Using the Chi square calculation, no significant relationships were found. Therefore, this hypothesis was supported.

Hypothesis 12

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Empathetic and the MBTI attitude Extraversion.

	Students Not Q(CEM)	Students Major Q(CEM)
Students who are E	54	33
Students who are not E	53	32

The calculated value of Chi square for this combination was 0.00. Therefore, this hypothesis was not supported. The Phi coefficient was .00.

Hypothesis 13

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Empathetic and the MBTI function Feeling.

	Students Not Q(CEM)	Students Major Q(CEM)
Students who are F	60	35
Students who are not F	47	30

The calculated value of Chi square for this combination was 0.08. Therefore, this hypothesis was not supported. The Phi coefficient was .02.

Hypothesis 14

> There is predicted to be no positive relationship between the OCSM element Qualitative Code Esthetic and any MBTI attitude or function.

Using the Chi square calculation, no significant relationships were found. Therefore, this hypothesis was supported.

Hypothesis 15

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Ethics and the MBTI attitude Introversion.

	Students Not Q(CET)	Students Major Q(CET)
Students who are I	72	13
Students who are not I	66	21

The calculated value of Chi square for this combination was 2.12. Therfore, this hypothesis was not supported. The Phi coefficient was .11.

Hypothesis 16

> There is predicted to be a positive relationship between OCSM element Qualitative Code Ethics and the MBTI function Thinking.

	Students Not Q(CET)	Students Major Q(CET)
Students who are T	63	14
Students who are not T	75	20

The calculated value of Chi square for this combination was 0.22. Therefore, this hypothesis failed to be supported. The Phi coefficient was .04.

Hypothesis 17

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Histrionics and the MBTI attitude Extraversion.

	Students Not Q(CH)	Students Major Q(CH)
Students who are E	67	20
Students who are not E	73	12

The calculated value of Chi square for this combination was 2.23. Therefore, this hypothesis failed to be supported. The Phi coefficient was .11.

Hypothesis 18

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Kinesics and the MBTI attitude Extraversion.

	Students Not Q(CK)	Students Major Q(CK)
Students who are E	57	30
Students who are not E	51	34

The calculated value of Chi square for this combination was 0.56. Therefore, this hypothesis failed to be supported. The Phi coefficient was .06.

Hypothesis 19

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Kinesics and the MBTI combination of the functions Intuition and Feelings.

	Students Not Q(CKH)	Students Major Q(CKH)
Students who are NF	18	16
Students who are not NF	90	48

The calculated value of Chi square for this combination was 1.76. Therefore, this hypothesis failed to be supported. The Phi coefficient was .10.

Hypothesis 20

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Kinesthetics and the MBTI function Sensing.

	Students Not Q(CKH)	Students Major Q(CKH)
Students who are S	29	80
Students who are not S	10	53

The calculated value of Chi square for this combination was 2.62.

Therefore, this hypothesis failed to be supported. The Phi coefficient was .12.

Hypothesis 21

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Proxemics and the MBTI attitude Extraversion.

	Students Not Q(CP)	Students Major Q(CP)
Students who are E	33	54
Students who are not E	47	38

The calculated value of Chi square for this combination was 5.21 and, therefore, this hypothesis was supported at the .05 level of significance. The Phi coefficient was .17.

Hypothesis 22

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Proxemics and the MBTI attitude Perception.

	Students Not Q(CP)	Students Major Q(CP)
Students who are P	37	55
Students who are not P	43	37

The calculated value of Chi square for this combination was 3.15 and, therefore, this hypothesis was not supported at the .05 level of significance. The Phi coefficient was .14.

Hypothesis 23

There is predicted to be a positive relationship between the OCSM element Qualitative Code Synnoetics and the MBTI function Intuition.

	Students Not Q(CS)	Students Major Q(CS)
Students who are N	34	29
Students who are not N	79	30

The calculated value of Chi square for this combination was 6.07 and therefore, this hypothesis was supported at the .05 level of significance. The Phi coefficient was .19.

Hypothesis 24

There is predicted to be a positive relationship between the OCSM element Qualitative Code Synnoetics and the MBTI attitude Judgment.

	Students Not Q(CS)	Students Major Q(CS)
Students who are J	47	33
Students who are not J	66	26

The calculated value of Chi square for this combination was 3.20 and, therefore, this hypothesis was not supported at the .05 level of significance. The Phi coefficient was .14.

Hypothesis 25

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Transactional and the MBTI attitude Extraversion.

	Students Not Q(CT)	Students Major Q(CT)
Students who are E	48	39
Students who are not E	55	30

The calculated value of Chi square for this combination was 1.63. Therefore, this hypothesis was not supported. The Phi coefficient was .10.

Hypothesis 26

> There is predicted to be a positive relationship between the OCSM element Qualitative Code Transactional and the MBTI function Feeling.

	Students Not Q(CT)	Students Major Q(CT)
Students who are F	53	42
Students who are not F	50	27

The calculated value of Chi square for this combination was 1.48. Therefore, this hypothesis failed to be supported. The Phi coefficient was .09.

Hypothesis 27

> There is predicted to be no positive relationship between the OCSM element Associates and any MBTI attitude or function.

Using the Chi square calculation, no significant relationships were found. Therefore, this hypothesis was supported.

Hypothesis 28

> There is predicted to be a positive relationship between the OCSM element Family and the MBTI attitude Extraversion.

	Students Not F	Students Major F
Students who are E	65	22
Students who are not E	75	10

The calculated value of Chi square for this combination was 5.19 and, therefore, this hypothesis was supported at the .05 level of significance. The Phi coefficient was .17.

Hypothesis 29

> There is predicted to be no positive relationship between the OCSM element Individuality and any MBTI attitude or function.

Using the Chi square calculation, no significant relationships were found. Therefore, this hypothesis was supported.

Hypothesis 30

> There is predicted to be a positive relationship between the OCSM element Difference and MBTI type ENTP.

	Students Not D	Students Major D
Students who are ENTP	2	8
Students who are not ENTP	52	110

The calculation of this combination was performed by using Fisher's Exact Probability because of the small cell size. The resulting value was 0.34. Therefore, this hypothesis was not supported. The Phi coefficient was .06.

Hypothesis 31

> There is predicted to be a positive relationship between the OCSM element Appraisal and the MBTI function Intuition.

	Students Not L	Students Major L
Students who are N	18	45
Students who are not N	41	68

The calculated value of Chi square for this combination was 1.45. Therefore, this hypothesis was not supported. The Phi coefficient was .09.

Hypothesis 32

> There is predicted to be a positive relationship between the OCSM element Appraisal and the MBTI attitude Perception.

	Students Not L	Students Major L
Students who are P	32	60
Students who are not P	27	53

The calculated value of Chi square for this combination was 0.02. Therefore, this hypothesis failed to be supported. The Phi coefficient was .01.

Hypothesis 33

> There is predicted to be a positive relationship between the OCSM element Magnitude and MBTI type ESTJ

	Students Not M	Students Major M
Students who are ESTJ	4	10
Students who are not ESTJ	68	90

The calculated value of Chi square for this combination was 1.11. Therefore, this hypothesis failed to be supported. The Phi coefficient was .08.

Hypothesis 34

> There is predicted to be a positive relationship between the OCSM element Relationship and the combination of the functions Intuition and Thinking.

	Students Not R	Students Major R
Students who are NT	9	20
Students who are not NT	74	69

The calculated value of Chi square for this combination was 4.14 and, therefore, this hypothesis was supported at the .05 level of significance. The Phi coefficient was .16.

Hypothesis 35

There is predicted to be a positive relationship between the OCSM element Deductive and the MBTI function Thinking.

	Students Not K	Students Major K
Students who are T	49	28
Students who are not T	56	39

The calculated value of Chi square for this combination was 0.39. Therefore, this hypothesis failed to be supported. The Phi coefficient was .05.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The problem in this study was to determine if the Myers-Briggs Personality Type Indicator and the Oakland Cognitive Style Map were measuring similar variables. This was done by calculating correlations of the 27 elements of the OCSM had the categories of the MBTI in the self-report profiles of a sample of students.

This experiment was one component of the Aviology Project implemented at nine project schools throughout the state of Florida during the 1975-76 academic year. The students enrolled in the Aviology course at the nine schools were given both the MBTI and the OCSM. Of the 321 who participated, 172 scores were selected to be used in the correlation study.

Thirty-five predictive hypotheses were generated. These hypotheses were confirmed or denied at .05 using a Chi square one-tailed test with one degree of freedom. Of the 35 hypotheses, 15 were confirmed.

Conclusions

Beyond the reporting of results in CHAPTER IV, there were other calculations available to aid interpretation of the results. The computer programs used in the study actually ran 44 separate analyses between each OCSM element and the MBTI functions, attitudes, types, and their combinations. In Hypotheses 4, 9, 12, 13, 15, 16, 25, 26, 30, 31, 32, and 35 there was not one statistically significant correlation. This means that

528 separate analyses were run for about one-third of the hypotheses, without one correlation appearing at the .05 level. The lack of correlation is striking considering the logical, theoretical match of descriptors of the OCSM elements and MBTI categories. This seems clearly to be the most notable finding of the study.

This researcher referred to the OCSM Interest Inventory and reviewed each item relating to the elements tested by the above 12 hypotheses. As far as could be discerned, the items seemed to be eliciting responses that would support the theoretical constructs of the Interest Inventory. Hence explanations of the lack of correlations need to be sought elsewhere than the logical fit of items and constructs.

Hypothesis 5 compared the OCSM element Theoretical Visual Quantitative, T(AQ), with the MBTI combination of the attitude Introversion, I, and the function Intuition, N. This was denied. But in the sample of 172 students there were seven who described themselves as the MBTI type--INFJ. All seven were reported as T(VQ) majors. This was statistically significant at the .05 level. This would seem to provide some support for the direction of the hypothesis since this was the only statistical significance noted for this OCSM element and the MBTI.

Hypothesis 6 compared the OCSM element Qualitative Auditory, Q(A), and the MBTI function Intuition, N. This was denied. Instead, it was reported that the MBTI attitude Thinking, function Judging, the combination Thinking-Judging and the MBTI type--ESTJ were all statistically correlated with this OCSM element. This would not be supported by the theoretical constructs of these elements and types. This researcher would question items numbered 14, 73, and 132 of the OCSM Interest Inventory.

Hypothesis 7 compared the OCSM element Qualitative Olfactory, Q(O), and the MBTI function Intuition, N. This was denied. While the data showed a strong tendency for these to be associated, it indicates that there is a weakness in certain items to draw out this association. This conclusion was reached from the fact that this association was shown to be a strong one as demonstrated in an empirical test conducted at Ohio State University as noted earlier on page 58 of this dissertation.

Hypothesis 17 compared the OCSM element Qualitative Histrionics, Q(CH), with the MBTI attitude Extraversion, E, and found that this combination did not relate statistically. However, within the sample, the majors of this OCSM element were reported to be almost two to one extraverts.

Hypotheses 18 and 19 compared the OCSM element Qualitative Kinesics, Q(CK), and the MBTI attitude Extraversion, E, and the MBTI combination of Intuition and Feeling, NF. These were denied. Instead, it was reported that the MBTI types INFP and INTJ were statistically related with this OCSM element. This result was not supported by the theoretical literature. This researcher could not determine the reason for such a result after examining both the MBTI descriptions and the OCSM Interest Inventory items.

Hypothesis 20 compared the OCSM element Qualitative Kinesthetics, Q(CKH), and the MBTI function Sensing, S. This was denied. The only statistically significant relationship reported was for the MBTI combination of Intuition and Thinking. There were 29 students out of the sample of 172 who reported themselves as having this MBTI combination, NT, and 27 of these were reported as Q(CKH) majors. This was significant at the .05 level. This relationship was not supported by the theory described in the literature. It is this researcher's opinion that items for this element of the OCSM Interest Inventory are of a low discriminatory nature since 133 students of 172 in the sample reported themselves as Q(CKH) majors.

Hypothesis 33 compared the OCSM element Magnitude, M, and the MBTI type ESTJ. This combination was found not to relate significantly, however, the MBTI combination EJ was shown to be related at the .01 level of significance with a Chi square value of 5.45. The direction of the prediction was correct but, the hypothesis was not sufficiently precise.

Considering that only 35 hypotheses were projected out of a large number of possible hypotheses, and considering that 57% of the hypotheses were denied, it must be concluded that, in this study, the MBTI and the OCSM were only loosely related and were measuring very few personological variables in common. Because the theories of Myers and Hill would seem to indicate a closer relationship than was demonstrated by this study's results, the question arises of how well each instrument fits its theory base.

The MBTI appears to have had rigorous evaluation and has reported respectable reliability and validity coefficients from numerous studies. With the evidence presented in the MBTI Manual, it must be concluded that the inventory is accurately measuring the variables that it was designed to measure, with a degree of accuracy of consistent with other self-report instruments.

In contrast, this researcher was able to locate only four OCSM studies concerned with validating the instrument: two studies of Hill's ten subtest battery and two studies of the OCSM Interest Inventory. All four studies were based on small samples and three of these reports carried a disclaimer prior to reporting the statistical data because of their small samples. In the remaining study, Heun et. al., the reliability of the OCSM Interest Inventory was based on a restricted sample and two very important assumptions were made by Heun in calculating the coefficients. First, the standard deviation of the general population was assumed to be twice that of the standard deviation of the restricted sample. This is an inappropriate assumption in some circumstances. In this case, the restricted sample was not randomly selected but simply chosen by class membership. This, in itself, does not create a problem because, in measurement theory, equal error variance or standard deviation is frequently assumed. However, the second assumption made in the Heun study is more serious in terms of calculating statistical reliability. In order to estimate population reliability, the researcher must be aware of the variability of the population as measured against a set of standardized norms. Heun simple stated that he assumed "that the wide range standard deviation of the entire population for all post-high school people would be at least twice as large as the standard deviation of the subject studies."[1] He does not present any evidence to support this major assumption which directly affects the estimate of reliability. The standard deviations could vary by a factor of two, but, without confirming statistics, there is no way of knowing.

Concerning Heun's efforts to establish the external validity of the OCSM Interest Inventory, the validity of only five elements of the Interest Inventory were calculated from the class gain scores and the resulting coefficients were low. (Appendix B, Table 4.) The procedure of basing validity coefficients on reliability coefficients as followed by Heun is highly suspect. It can be stated that the reliability of an instrument does affect the validity of that instrument, in that it reduces the upper limit of the correlation coefficient. But, to say that the validity of that instrument is equal to the square of the reliability coefficient is simply not true.[2] This conclusion was verified in a telephone conversation with Dr. John Schmid, former editor of The Journal of Covariant Analysis.

Recommendations

One possible explanation for the apparent lack of relationships between the OCSM and the MBTI is that they measure independent traits. It is still the conviction of this researcher that the two theories of Jung and Hill should show a greater relationship than was indicated in this study. It is possible that the low Phi coefficients could have been a result of the design of the study. It is therefore recommended that a replication of the study be done using Kelley's theory of psychological traits. Applying the theory to both the cognitive style battery and the MBTI, the researcher would compare only the scores of those individuals who scored in the top 27 percent of the various cognitive styles and the top 27 percent of the functions and attitudes of the MBTI. Kelley stated that "Twenty-seven percent should be selected at each extreme to yield upper and lower groups which are most indubitably different with respect to the trait in question." Such an approach should increase the likelihood of discovering the true relationships between the theories of Jung and Hill. Through this study, the researcher has come to a deeper understanding of the potential that these two instruments have for education when they are used in combination.

The Jungian approach is intuitive and seeks to find the inner motivations of individuals. By deducing the manner in which individuals interpret and react to their world, the Jungian theory gives students a better knowledge of themselves. Having clarified the dominant functions and attitudes of their personalities, students may have more control over their own actions in various situations and may be able to use their own personality strengths to best advantage.

The Hill approach is empirical and provides various approaches to the cognitive understanding of one's world. By understanding the cognitive style, the teacher can provide learning situations which introduce students to new material through the most convenient medium for each student. After the knowledge has become familiar, the teacher can then have the student manipulate the material in other learning modes. In this way, the teacher enables the student to develop a wide variety of cognitive skills without suffering repeated failures in the less developed cognitive styles.

By combining the two approaches, the teahcer and the student become a team seeking the best alternatives in meeting new situations. In addition, both approaches seek to broaden the abilities of the individual to function in other ways than a fixed reaction pattern which may not meet all the requirements of a changing, living situation. These are applications that practioners can make while further research continues.

It is further recommended that experienced users of cognitive style batteries take the responsibility for conducting reliability and external validity studies. Until more of such studies are done, the stability and scope of the instrument are not known and its relationship to MBTI measured variables cannot be identified.

Notes--Chapter V

1. Heun, Richard E., Heun, Linda R., and Schnucker, R. V., *Edumetric Validation of Cognitive Style Map Items and Elements: I*, U. S. Dept. of Health, Education, and Welfare, (ERIC #ED113362), p. 10.

2. Taped telephone conversation with John Schmid, Director, Bureau of Research Services, Professor of Statistics, University of Northern Colorado, Greeley, Colorado, April 11, 1980.

3. Kelley, Truman L., "The Selection of Upper and Lower Groups for the Validation of Test Items," *The Journal of Educational Psychology*, January, 1939, XX, p. 17.

APPENDIX A

Dear Participant:

You will be selecting one of three categories to identify your true and honest evaluation of the self-inventory statements. The results of this inventory will be used to help us determine your major ways of searching for meaning. In order that this inventory becomes useful, it is important that you be completely honest in your choice.

There are no GOOD or BAD; RIGHT or WRONG selections. A computerized "Cognitive Style Map" will be produced on the basis of the information you allow us to feed into the computer bank.

Print your name and Social Security Number at the bottom of the first page. Do not ponder over any one statement for a long time. Although you will not be timed, complete the inventory without excessive hesitation.

After you have read a statement mark the one square that best describes your evaluation of that statement as it applies to you.

When you have completed the entire inventory, please fill out the Tally Sheet.

Instructions (TALLY SHEET)

PRINT YOUR NAME AND SOCIAL SECURITY NUMBER ON THE TALLY SHEET.

Following each inventory item you will find a code: 2F, 23A, etc. The letter of each code should be written in the chosen Rarely - Sometimes - Usually column of the Tally Sheet in the linear space indicated by the numeral of that code. In example:

> If you answered item 5 in the Sometime column,
> you should note the code following that item (14C).
> On line 14 of the Tally Sheet, in the Sometime
> column, you would place the letter "C".

Q-SORT LIST

		Usually	Sometimes	Rarely
1. I can remember a telephone number once I hear it.	2F	☐	☐	☐
2. I understand a topic better if I examine it to learn how it differs from other topics.	23A	☐	☐	☐
3. I can act hurt and depressed in order to acquire favors.	14F	☐	☐	☐
4. I can predict my prospects for success in most situations.	18A	☐	☐	☐
5. I can give the impression that I am happy and comfortable even though I am angry and uncomfortable.	14C	☐	☐	☐
6. I find it easier to win an argument when I state a premise (Blank is true) and give a conclusion to the premise which is inescapable: (Therefore, Blank must be true).	27E	☐	☐	☐
7. I am able to put people at ease in tense situations.	19E	☐	☐	☐
8. I feel uncomfortable when children call me by my first name.	17F	☐	☐	☐
9. I know my anxiety threshold.	18H	☐	☐	☐
10. I use facial expressions in showing emotion.	15B	☐	☐	☐

Name ______________________

SS# ______________________

		Usually	Sometimes	Rarely
11. I have little need for others to help me make decisions.	22F	[ ]	[ ]	[ ]
12. In group discussions, I am the catalyst for reaching decisions.	19B	[ ]	[ ]	[ ]
13. My "best" decisions are made alone.	22G	[ ]	[ ]	[ ]
14. I can recognize who is on the phone just by listening for a few moments.	5C	[ ]	[ ]	[ ]
15. When I drive a car, I look ahead and in other directions outside of the car.	10E	[ ]	[ ]	[ ]
16. I would wait to be introduced to a "big name" rather than introduce myself.	17A	[ ]	[ ]	[ ]
17. I set goals consistent with my needs and abilities.	18C	[ ]	[ ]	[ ]
18. I can convince others to do the things that I would like them to do.	19D	[ ]	[ ]	[ ]
19. Children find it easy to get along with me.	19A	[ ]	[ ]	[ ]
20. I can tell whether or not I will be able to get my work done.	18D	[ ]	[ ]	[ ]
21. If I bump against another person in a store, I apologize.	17G	[ ]	[ ]	[ ]
22. Information should be analyzed in a number of ways before a conclusion is reached.	24D	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
23.	My written explanations are better than my spoken ones.	3B	☐	☐	☐
24.	I am seldom "brushed off".	17C	☐	☐	☐
25.	I prefer to be in lecture type classes.	1H	☐	☐	☐
26.	I find it easy to add spoken or dictated numbers mentally.	2A	☐	☐	☐
27.	I am well-coordinated.	16B	☐	☐	☐
28.	I know what my physical responses will be to a particular task.	18F	☐	☐	☐
29.	I enjoy concerts.	12C	☐	☐	☐
30.	I can act "cultured" when the situation demands such formalized behavior.	14E	☐	☐	☐
31.	I would stop for a STOP sign at 3:00 a.m., even if there were no other person in sight.	13H	☐	☐	☐
32.	I use my fingers to determine the quality of the finish on wood.	8C	☐	☐	☐
33.	I can distinguish fresh bread from stale bread by the smell.	6B	☐	☐	☐
34.	I can tell "what's for dinner" by the smell.	6A	☐	☐	☐
35.	I can tell the difference between two closely related sounds.	5F	☐	☐	☐

		Usually	Sometimes	Rarely
36. Walking with a spring in your step gives the impression that you are happy.	15E	[ ]	[ ]	[ ]
37. In my choice of clothing, I usually wear contrasting colors.	23C	[ ]	[ ]	[ ]
38. I can tell whether milk is sour by tasting it.	7A	[ ]	[ ]	[ ]
39. I enjoy the beauty of people dancing.	12A	[ ]	[ ]	[ ]
40. Oral mathematics tests are easy for me.	2C	[ ]	[ ]	[ ]
41. I choose music to fit my mood.	23G	[ ]	[ ]	[ ]
42. The taste of food is more important than its appearance.	7C	[ ]	[ ]	[ ]
43. People say I speak better than I write.	1G	[ ]	[ ]	[ ]
44. If I were buying a car, I would discuss the engine specifications with the salesman.	2H	[ ]	[ ]	[ ]
45. After I write a letter, I ask someone to read it to me so that I know that it sounds right.	1F	[ ]	[ ]	[ ]
46. I understand the daily news if I hear it on the radio.	1C	[ ]	[ ]	[ ]
47. The rules of our society should apply equally to all.	13A	[ ]	[ ]	[ ]
48. I do not permit personal affairs to interfere with completing an assignment.	13E	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
49.	I can repair objects with small parts without watching my hands.	16A	[ ]	[ ]	[ ]
50.	I have no sympathy for people who break the law.	25B	[ ]	[ ]	[ ]
51.	I do well on a test if it is about information I heard in a lecture.	1B	[ ]	[ ]	[ ]
52.	I prefer furniture that "feels" good when I run my hand over the upholstery.	8D	[ ]	[ ]	[ ]
53.	I prefer to communicate with friends and colleagues by telephone rather than writing notes to them.	1D	[ ]	[ ]	[ ]
54.	I discuss the "sale" prices before I go shopping.	2G	[ ]	[ ]	[ ]
55.	Eye movements are important supplements to my conversations.	15H	[ ]	[ ]	[ ]
56.	I can write legibly while another person dictates to me.	10D	[ ]	[ ]	[ ]
57.	I decide that my hair needs washing by the way it feels.	8F	[ ]	[ ]	[ ]
58.	When given a job to do, I prefer to work on it myself.	22H	[ ]	[ ]	[ ]
59.	I am able to offer criticism without offending.	11E	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
60.	My friends tell me that I am understanding.	11A	☐	☐	☐
61.	I avoid saying things which hurt the feelings of others.	11D	☐	☐	☐
62.	When looking at something constructed by someone else (e.g., a painting, a building, a piece of furniture) I like to figure out why the person created it as he did.	26D	☐	☐	☐
63.	I prefer to read a paper myself rather than have someone read it aloud to me.	3F	☐	☐	☐
64.	My "suffering" in the dentist's chair is alleviated if he does not use unpleasant tasting materials in my mouth.	7H	☐	☐	☐
65.	I prefer to read directions rather than have someone read them to me.	3G	☐	☐	☐
66.	I require beauty in my surroundings.	12B	☐	☐	☐
67.	I understand the emotions of others.	11B	☐	☐	☐
68.	When someone is frightened, I can be patient and calm rather than get angry with them.	11F	☐	☐	☐
69.	I am able to "play a role" if I agree to.	14D	☐	☐	☐
70.	I prefer to ask favors of close friends and associates rather than from work supervisors.	17B	☐	☐	☐
71.	Religion is a purely personal thing.	22B	☐	☐	☐

			Usually	Sometimes	Rarely
72.	When given a problem to solve, I can come to the best solution by myself.	22D	[ ]	[ ]	[ ]
73.	Random sounds interfere with my ability to concentrate.	5G	[ ]	[ ]	[ ]
74.	I choose clothes for the way they look.	9B	[ ]	[ ]	[ ]
75.	I keep good written records in my check book.	4C	[ ]	[ ]	[ ]
76.	I score high on achievement tests which emphasize reading comprehension.	3D	[ ]	[ ]	[ ]
77.	I can run and catch a ball that has been struck or thrown.	10A	[ ]	[ ]	[ ]
78.	I make my own political choices.	22A	[ ]	[ ]	[ ]
79.	I like to share ideas with friends and associates.	20D	[ ]	[ ]	[ ]
80.	I would rather do things my way even if they don't conform to the expectations of my family or firends.	22C	[ ]	[ ]	[ ]
81.	I regard my personal goals as most important.	22E	[ ]	[ ]	[ ]
82.	Before taking a new job, I discuss it with my firends.	20E	[ ]	[ ]	[ ]
83.	Sales people find the merchandise that I'm asking for.	19H	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
84.	I "talk with my hands".	15D	[ ]	[ ]	[ ]
85.	I enjoy listening to good music for the quality of its sound.	12D	[ ]	[ ]	[ ]
86.	I can tolerate the inability to concentrate which characterizes those who are newly "in love".	11G	[ ]	[ ]	[ ]
87.	I can imitate someone else before a group.	14A	[ ]	[ ]	[ ]
88.	I often have to make a decision before I know enough about the situation.	24A	[ ]	[ ]	[ ]
89.	I talk with my family before doing anything that might affect them.	21D	[ ]	[ ]	[ ]
90.	Before voting in an election, I review choices with my family.	21A	[ ]	[ ]	[ ]
91.	I make it a point not to let my work interfere with family plans.	21H	[ ]	[ ]	[ ]
92.	I can act attentive and interested even though bored when listening to a teacher or supervisor.	14H	[ ]	[ ]	[ ]
93.	I live according to moral values.	13B	[ ]	[ ]	[ ]
94.	I understand how a person feels when being punished.	11C	[ ]	[ ]	[ ]
95.	The quality of my work does not vary when the supervisor is away.	13G	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
96.	I prefer verbal directions.	1E	☐	☐	☐
97.	When I go shopping, I read the prices of my purchases and add them in my head.	4G	☐	☐	☐
98.	I enjoy art exhibits.	9C	☐	☐	☐
99.	When shopping for clothes, I like to have a friend along to help me make choices.	20C	☐	☐	☐
100.	I feel better acquainted with someone after seeing pictures of him rather than reading about him.	9H	☐	☐	☐
101.	I interpret a person's mood by the way he sits or poses.	15G	☐	☐	☐
102.	I do well in classes which rely heavily on textbooks.	3C	☐	☐	☐
103.	I shrug my shoulders when saying "I don't know."	15C	☐	☐	☐
104.	Unless spoken to first, I do not speak to a supervisor.	17D	☐	☐	☐
105.	I have no difficulty in understanding how to put puzzles together.	26E	☐	☐	☐
106.	In play as well as work and life in general, I find it essential to "play by the rules".	25E	☐	☐	☐
107.	I find it important to consult my family in planning vacations.	21E	☐	☐	☐

			Usually	Sometimes	Rarely
108.	I can anticipate accurately how well I will do in a new situation.	18B	☐	☐	☐
109.	I am able to tell which groups of instruments are playing at various times during a concert.	5E	☐	☐	☐
110.	Characteristics for successful people are not the same as those for unsuccessful people.	23H	☐	☐	☐
111.	When taking classes in mathematics, I find it easy to "talk in formulas" with my classmates and teacher.	2D	☐	☐	☐
112.	I do not pat strangers on the back if I have an occasion to congratulate them.	17H	☐	☐	☐
113.	I enjoy the beauty of the stars.	12F	☐	☐	☐
114.	I quote statistics to others in order to prove my point in an argument.	2B	☐	☐	☐
115.	I solve written mathematical problems rapidly.	4A	☐	☐	☐
116.	I enjoy acquiring good motor skills so that I can compete successfully in sports.	16G	☐	☐	☐
117.	Poetry is beautiful because of its concepts as well as its words and structure.	12G	☐	☐	☐
118.	I know my capabilities.	18E	☐	☐	☐

			Usually	Sometimes	Rarely
119.	I score high on written mathematics tests.	4B	[ ]	[ ]	[ ]
120.	If I were buying a car, I would ask the salesman to provide written specifications.	4H	[ ]	[ ]	[ ]
121.	When I tune a musical instrument, I use the piano or another instrument for the correct pitch.	10F	[ ]	[ ]	[ ]
122.	I am considered to be a "good" amateur athelete.	10H	[ ]	[ ]	[ ]
123.	I find it easy to understand written numerical specifications.	4F	[ ]	[ ]	[ ]
124.	I enjoy activity more when my friends participate in it with me.	20B	[ ]	[ ]	[ ]
125.	I find the reasoning patterns required in statistics rewarding to use.	27C	[ ]	[ ]	[ ]
126.	Paint smell in a room is disturbing to me.	6G	[ ]	[ ]	[ ]
127.	I understand geometric theorems.	27G	[ ]	[ ]	[ ]
128.	When shopping for clothes, if I find the article I had in mind at a fair price, I buy it without further comparison.	25F	[ ]	[ ]	[ ]
129.	I "play the devil's advocate" with people to force them to look at other points of view.	23E	[ ]	[ ]	[ ]
130.	I am a good actor.	14B	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
131.	My partners tell me I am a good dancer.	10B	[ ]	[ ]	[ ]
132.	I can tell if something is wrong with an engine by listening to it.	5A	[ ]	[ ]	[ ]
133.	I would give up an immediate goal rather than sacrifice a principle.	13D	[ ]	[ ]	[ ]
134.	I can shout and act tough in order to frighten others when I am frightened myself.	14G	[ ]	[ ]	[ ]
135.	I have practiced handwriting skills until I write legibly.	16H	[ ]	[ ]	[ ]
136.	I enjoy outdoor activities more if my family is with me.	21C	[ ]	[ ]	[ ]
137.	I consult with my immediate family before making important decisions.	21G	[ ]	[ ]	[ ]
138.	I understand events better after I have discussed them with my family.	21F	[ ]	[ ]	[ ]
139.	I make personal decisions after discussing them with my friends.	20F	[ ]	[ ]	[ ]
140.	The family that prays together stays together.	21B	[ ]	[ ]	[ ]
141.	I am able to persuade people in disagreement to strive for agreement.	19C	[ ]	[ ]	[ ]
142.	Peers involve me in resolving problems.	19F	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
143.	I enjoy trying new foods in order to find new tastes that are pleasing to me.	7G	[ ]	[ ]	[ ]
144.	I prefer to read articles which are accompanied by pictures or drawings.	9A	[ ]	[ ]	[ ]
145.	I return to a restaurant because the food there tasted good.	7E	[ ]	[ ]	[ ]
146.	The tone or inflection of a speaker's voice gives additional meaning to what he says.	5B	[ ]	[ ]	[ ]
147.	I can get dressed in the dark.	8B	[ ]	[ ]	[ ]
148.	I don't understand how people can appreciate a problem until they know as much about it as possible.	24C	[ ]	[ ]	[ ]
149.	Learning to swing a bat or golf club the right way is important.	16C	[ ]	[ ]	[ ]
150.	When I attack a problem, I approach it from as many angles as possible.	24B	[ ]	[ ]	[ ]
151.	I tune the radio by sound, not by looking at the dial.	5H	[ ]	[ ]	[ ]
152.	I can feel the difference between wool worsted and double knit.	8A	[ ]	[ ]	[ ]
153.	I believe that the customary smell of a store influences its sales volume.	6E	[ ]	[ ]	[ ]
154.	When I type, I keep my eyes on the copy.	10C	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
155.	At parties, I am verbally able to stop arguments involving others before they go too far.	19G	[ ]	[ ]	[ ]
156.	I blush.	15A	[ ]	[ ]	[ ]
157.	Life is simplified if you go by the rules.	25C	[ ]	[ ]	[ ]
158.	I work best in a structured situation.	25A	[ ]	[ ]	[ ]
159.	I avoid probability statements in solving problems.	27H	[ ]	[ ]	[ ]
160.	I can identify musical notes well enough to recognize a "tune" the next time I hear it.	5D	[ ]	[ ]	[ ]
161.	I prefer working in situations where standards and rules are stated explicitly.	25D	[ ]	[ ]	[ ]
162.	I pick up and feel vegetables and fruits in the store before buying them.	8E	[ ]	[ ]	[ ]
163.	I value my friends' political opinions.	20G	[ ]	[ ]	[ ]
164.	Knowledge flows logically from given premises.	27F	[ ]	[ ]	[ ]
165.	I enjoy practicing dance steps until I can do them perfectly.	16D	[ ]	[ ]	[ ]
166.	I understand more easily by reading than by hearing.	3H	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
167.	When I shake hands with someone, the handshake tells me something about them.	15F	☐	☐	☐
168.	A person can never know enough about life.	24F	☐	☐	☐
169.	I try to understand why people break rules.	26F	☐	☐	☐
170.	There's always a reason for a person's behavior.	26G	☐	☐	☐
171.	I like to figure out how parts of a whole fit together.	26B	☐	☐	☐
172.	I laugh with the person who laughs when he stubs his toe because I know it hurts.	11H	☐	☐	☐
173.	In selecting a beverage, my choice is based on taste appeal.	7F	☐	☐	☐
174.	I tend to see all parts of the world as being interconnected.	26C	☐	☐	☐
175.	I find the type of reasoning demanded by the rules of mathematics suits my style of thinking.	27D	☐	☐	☐
176.	To become a good typist, I would practice correct finger movements.	16E	☐	☐	☐
177.	I "think" in pictures and graphic models instead of words and phrases.	9F	☐	☐	☐
178.	When I tune a radio, I pay close attention to the numbers on the dial.	9G	☐	☐	☐

			Usually	Sometimes	Rarely
179.	When cooking, I use various spices until the dish tastes "right".	7B	[ ]	[ ]	[ ]
180.	Problem-solving involves related variables.	26H	[ ]	[ ]	[ ]
181.	I can program myself to handle boring tasks.	18G	[ ]	[ ]	[ ]
182.	It is easy for me to remember the numbers and formulas I hear during a conversation.	2E	[ ]	[ ]	[ ]
183.	I use a written budget in order to manage money for which I am responsible.	4E	[ ]	[ ]	[ ]
184.	I would find it interesting to discover how people behave by evaluating things which make people tick (e.g., physiological, sociological, and psychological).	26A	[ ]	[ ]	[ ]
185.	I enjoy games or puzzles in which the solution is deduced from information contained in the rules.	27A	[ ]	[ ]	[ ]
186.	Holidays are different from other days of the year.	23F	[ ]	[ ]	[ ]
187.	There are as many facets to a problem as there are on a well cut diamond.	24H	[ ]	[ ]	[ ]
188.	I learn a subject better when I can discuss it with my peers.	20A	[ ]	[ ]	[ ]
189.	I believe that a promise should be kept.	13F	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
190.	I know how far I can go without being reprimanded.	17E	[ ]	[ ]	[ ]
191.	After I dictate a letter, I have to read it to be certain it is correct.	3A	[ ]	[ ]	[ ]
192.	When I play golf or other sports, I take several practice swings before I start to play.	16F	[ ]	[ ]	[ ]
193.	I can distinguish between several varieties of flowers by smelling them.	6C	[ ]	[ ]	[ ]
194.	When I am in a group of people trying to solve a written problem involving numbers, I am among the first to reach the solution.	4D	[ ]	[ ]	[ ]
195.	I find reasoning like this statement helps me to clarify my thoughts: "All men are mortal; Socrates is a man; Socrates is mortal".	27B	[ ]	[ ]	[ ]
196.	The more I know about a problem, the more I want to know about it.	24G	[ ]	[ ]	[ ]
197.	I would give up monetary gain to avoid a compromise of principles.	13C	[ ]	[ ]	[ ]
198.	Utility and efficiency are important but they should not be emphasized to the exclusion of beauty.	12H	[ ]	[ ]	[ ]
199.	In evaluating the performance of others, I find it helpful to determine how this performance differed from another performance.	23D	[ ]	[ ]	[ ]

			Usually	Sometimes	Rarely
200.	The "smell" is an important part of the pleasure connected with a new car.	6F	☐	☐	☐
201.	I prefer to write with a pen that "feels" good to my fingers.	8H	☐	☐	☐
202.	I can distinguish a nickel from a dime in my pocket without looking at it.	8G	☐	☐	☐
203.	Blindfolded, I can taste the difference between chicken and beef.	7D	☐	☐	☐
204.	The aromas in a room determine for me whether it is pleasant or unpleasant.	6D	☐	☐	☐
205.	I would go out of my way to see beautiful scenery.	12E	☐	☐	☐
206.	I don't find sufficient reason to change my mind on a subject once I identify the rule which applies.	25G	☐	☐	☐
207.	I use jokes or humorous remarks to change the focus in different situations.	23B	☐	☐	☐
208.	When there are gas fumes in the car or the house, I notice them.	6H	☐	☐	☐
209.	In evaluating the performance of others, I find it important to determine the standards which were set for them.	25H	☐	☐	☐
210.	I have no difficulty in following a map.	3E	☐	☐	☐

			Usually	Sometimes	Rarely
211.	I understand a lecturer better if I can see him while he talks.	9D	[ ]	[ ]	[ ]
212.	I would join a particular religious group because my friends belong to it.	20H	[ ]	[ ]	[ ]
213.	I can make more sense out of what a person means when he speaks to me rather than when he writes to me.	1A	[ ]	[ ]	[ ]
214.	I take longer than others in coming to a conclusion because I want to know more about an issue than they do.	24E	[ ]	[ ]	[ ]
215.	I can pitch horseshoes or lawn darts quite well.	10G	[ ]	[ ]	[ ]
216.	A story is easier to understand in a movie than in a book.	9E	[ ]	[ ]	[ ]

COGNITIVE STYLE MAPPING

TALLY SHEET

NAME (Please Print) ________________ SS# ________________

PLACE ________________

NOS	ITEMS	USUALLY	SOMETIMES	RARELY
1	T(AL)			
2	T(AQ)			
3	T(VL)			
4	T(VQ)			
5	Q(A)			
6	Q(O)			
7	Q(S)			
8	Q(T)			
9	Q(V)			
10	Q(P)			
11	Q(CEM)			
12	Q(CES)			
13	Q(CET)			
14	Q(CH)			
15	Q(CK)			
16	Q(CKH)			
17	Q(CP)			
18	Q(CS)			
19	Q(CT)			
20	A			
21	F			
22	I			
23	D			
24	L			
25	M			
26	R			
27	(K)			

OAKLAND COMMUNITY COLLEGE

APPENDIX B

Table 10
Means and Standard Deviations for Cognitive Mapping Gain Scores

Element		1	2	3	4	5	6	7	8	Total
T(AL)	$\overline{X}$	.0563	-.1127	.2254	.1408	.0563	.1972	.0000	2.2817	.4225
	SD	1.3415	1.4197	1.7619	1.1784	1.4621	1.6836	1.6784	1.7213	5.1229
T(AQ)	$\overline{X}$	.2817	.5352	.1408	.2817	.2817	.2817	.0845	.3662	2.3380
	SD	1.4745	1.2982	1.3140	1.5122	1.4745	1.3550	1.2754	1.7860	4.6023
T(VL)	$\overline{X}$	.0563	.1690	.3944	.2254	.2817	-.0845	.3662	.3099	1.8028
	SD	1.1614	1.4141	1.7641	1.1408	1.3960	1.5175	1.6206	1.4495	4.9579
T(VQ)	$\overline{X}$	.2254	.1690	.2817	.2254	.2254	-.3099	.0854	.5070	1.6620
	SD	1.5216	1.2245	1.3960	1.1891	1.5582	1.5618	1.5175	1.5279	3.2887
Q(A)	$\overline{X}$	-.1408	.5634	.0000	.3099	.4225	.5070	-.3944	.1972	1.5211
	SD	1.4756	1.1225	1.4241	1.1938	1.2063	1.3725	1.4868	1.1730	4.1175
Q(O)	$\overline{X}$	.1972	.8451	.6479	.3099	.7887	.3380	.1690	.2254	3.5493
	SD	1.3068	1.6670	1.5664	1.1938	1.6944	1.5377	1.3737	1.1408	5.2347
Q(S)	$\overline{X}$	.5634	.1127	.0282	.2535	.0563	.1690	.3099	.2958	2.4225
	SD	1.3504	1.4588	1.2779	1.3397	1.2988	1.0479	1.1938	1.8644	6.2881
Q(T)	$\overline{X}$	.1127	.0845	.3380	.3099	.1972	.1972	.0563	.0563	1.3803
	SD	.6618	.9154	1.5739	1.2847	1.1211	1.4303	1.119	1.2988	4.4099
Q(V)	$\overline{X}$	.1690	.3380	.1127	.4225	.0563	-.0282	.0282	-.2817	.6197
	SD	1.4141	1.4236	1.2050	1.2964	1.7107	1.4435	1.3632	1.4745	4.6594
Q(P)	$\overline{X}$	.1408	.4507	.1690	.1127	.6197	-.0282	.3380	.3662	2.1772
	SD	1.1296	1.5454	1.0479	1.4588	1.3673	1.3212	1.2553	1.5128	4.8596
Q(CEM)	$\overline{X}$	.0000	.3380	.0000	.0845	.1972	.2535	.3380	.0563	1.3521
	SD	1.3001	1.3834	1.5382	.7827	1.1703	1.1594	1.3421	1.2547	4.6606
Q(CES)	$\overline{X}$	.1408	.3099	.2817	.1690	.2817	.3099	.2535	.0563	1.7465
	SD	1.0785	1.3696	1.3550	.8719	1.1770	1.0953	1.3811	1.4621	5.1010
Q(CET)	$\overline{X}$	.2817	.3380	.2254	.3662	.2254	.1408	.0563	-.0704	1.4085
	SD	1.6546	1.2994	1.3655	1.3966	1.2356	.8441	1.0600	1.1906	4.6560
Q(CH)	$\overline{X}$	.0845	.2535	.1127	.2817	.3099	-.0282	.1972	.3521	1.6620
	SD	1.5542	1.3397	1.6059	1.3960	1.1456	1.2779	1.6498	1.5931	6.1345
Q(CK)	$\overline{X}$	-.0845	-.0141	.2394	.4789	.0563	.3380	.1127	.4789	1.3803
	SD	1.1838	1.2615	1.3683	1.2317	1.4621	1.2096	1.4588	1.3621	4.6825
Q(CKH)	$\overline{X}$	.3662	.2817	.0282	.0845	.1408	-.0845	.2535	-.1972	.9577
	SD	1.4363	1.1770	1.2330	1.4799	1.3562	1.3699	1.4604	1.5800	5.1700
Q(CP)	$\overline{X}$	.1690	.1690	.4225	-.1690	.0000	.1408	.2535	.4789	1.4085
		1.1004	1.2890	1.7735	1.5653	1.2840	1.0250	1.4213	1.5910	4.4834

Table 10
Means and Standard Deviations for
Cognitive Mapping Gain Scores cont.

Element		1	2	3	4	5	6	7	8	Total
Q(CS)	$\overline{X}$	.3380	.4507	.1408	.4789	-.0282	.1972	.3662	.3380	2.1127
	SD	1.0062	1.3509	1.3140	1.2767	1.3632	1.2175	1.3966	1.2553	4.9435
Q(CT)	$\overline{X}$	.4507	.6761	.2254	.2535	-.0282	.1408	.0000	.4225	1.9718
	SD	1.1723	1.1601	1.4062	1.0031	1.3212	1.3140	1.2560	1.3806	4.7766
A	$\overline{X}$	-.3944	-.1127	.1408	.0282	.0845	-.2535	.0845	-.1127	-.4507
	SD	1.5608	1.4197	1.3140	1.4039	1.6930	1.3397	1.3188	1.4197	4.2220
F	$\overline{X}$	-.1408	.0845	.1972	.1127	-.1127	-.1127	.2113	-.0423	.1972
	SD	1.3971	1.5175	1.1703	1.5704	1.4197	1.3380	1.4134	1.2609	4.0302
I	$\overline{X}$	.3662	.1690	.1972	.2254	.0563	.3662	.3944	-.1127	1.4930
	SD	1.3556	1.3737	1.3068	1.3655	1.4621	1.1777	1.3266	.9427	3.8816
M	$\overline{X}$	.0282	.1408	.1972	.3944	.1972	.3944	.6197	-.0563	2.4507
	SD	1.5562	1.4756	1.7811	1.5243	1.2629	1.3266	1.6981	1.5372	7.3863
D	$\overline{X}$	-.2535	.1690	.0845	-.0845	.0563	.1268	.0282	.1127	.1408
	SD	1.3397	1.6009	1.5175	1.0844	1.2547	1.5916	1.2330	1.3794	5.0610
R	$\overline{X}$	.0845	.5352	.1690	-.1972	-.0845	.3662	.1127	-.1408	1.0896
	SD	1.4413	1.6769	1.5289	1.1211	1.0844	1.3766	1.4969	1.4756	4.3221
L	$\overline{X}$	.0000	.2535	.1690	.2254	.4789	.2817	.1408	.0563	1.8169
	SD	1.3427	1.2297	1.4534	1.4842	1.3200	1.3550	1.3971	1.2547	4.9027
(K)	$\overline{X}$	.6479	-.1690	.0845	.1408	.4225	.2254	.2535	-.1127	1.5211
	SD	1.4927	1.6698	1.3609	1.2704	1.4208	1.3655	1.3397	1.4588	4.5218

Table 11
Three Measures of Edumetric Reliability for Cognitive Style Mapping Elements

Element	Kuder-Richardson-20 Reliability Coefficient	Split-Half Reliability Coefficient	Standard Error of Measurement
T(AL)	.313	.274	4.2459
T(AQ)	.242	.347	4.0068
T(VL)	.363	.305	3.9505
T(VQ)	.624	.184	1.8486
Q(A)	.211	.028	3.6572
Q(O)	.442	.372	3.9103
Q(S)	.708	.383	3.4553
Q(T)	.459	.624	3.2435
Q(V)	.289	.339	3.9308
Q(P)	.447	.338	3.6099
Q(CEM)	.376	.339	3.6818
Q(CES)	.560	.629	3.3835
Q(CET)	.447	.327	3.4622
Q(CH)	.629	.699	3.7355
Q(CK)	.415	.521	3.4816
Q(CKH)	.482	.477	3.7259
Q(CP)	.234	.434	3.9239
Q(CS)	.533	.718	3.3784
Q(CT)	.510	.588	3.3436
A	.082	.051	4.0451
F	.054	.286	3.9198
I	.121	.374	3.6600
M	.752	.646	3.6784
D	.458	.355	3.7259
R	.162	.213	3.9565
L	.429	.516	3.7049
(K)	.233	.167	3.9602

Table 12
Edumetric Internal Validity for Cognitive Style
Mapping Items and Elements

Elements	Item 1	2	3	4	5	6	7	8	Element
T(AL)	.3408	.4946	.4139	.3728	.2977	.3757	.4325	.2946	.571
T(AQ)	.3679	.2715	.5977	.4639	.3928	.3732	.4366	.3482	.613
T(VL)	.3835	.2860	.3567	.4661	.4883	.4920	.5138	.4475	.644
T(VQ)	.2863	.2215	.4134	.1777	.3980	.0759	.2586	.2997	.379
Q(A)	.2485	.4119	.3363	.4543	.2903	.6112	.4201	.0196	.527
Q(O)	.5401	.4633	.4960	.3379	.4970	.3689	.5797	.3661	.677
Q(S)	.5023	.3387	.2159	.1545	.2799	.3140	.2678	.4074	.459
Q(T)	.5837	.5154	.5659	.4913	.3552	.5017	.3174	.3700	.685
Q(V)	.4374	.2573	.5596	.4791	.2643	.3545	.3610	.5667	.618
Q(P)	.3853	.4612	.4807	.3548	.3296	.5806	.4421	.5195	.663
Q(CEM)	.4370	.5582	.4715	.1849	.4056	.5671	.6475	.4494	.688
Q(CES)	.5185	.4306	.4423	.4403	.6312	.5485	.4249	.6364	.737
Q(CET)	.5189	.4335	.3754	.5532	.3561	.4942	.3835	.4041	.657
Q(CH)	.6116	.4217	.5815	.4124	.4558	.4156	.5744	.5166	.726
Q(CK)	.3564	.2751	.5507	.3738	.4824	.5244	.4308	.5235	.657
Q(CKH)	.3014	.0482	.4282	.5336	.5986	.3633	.6013	.3714	.612
Q(CP)	.2601	.4657	.2865	.3149	.3904	.2878	.4479	.6163	.580
Q(CS)	.3208	.4311	.5960	.4914	.5857	.3614	.6305	.4659	.711
Q(CT)	.2538	.1966	.6803	.3072	.6515	.4405	.6292	.4717	.675
A	.3920	.3957	.3263	.4679	.3837	.1790	.2598	.3393	.516
F	.4152	.3924	.2307	.3347	.2796	.4534	.4279	.3675	.548
I	.3458	.2908	.3751	.4042	.3922	.3610	.3123	.4001	.544
M	.4988	.3767	.3444	.5397	.2562	.5511	.4853	.3992	.646
D	.2628	.4838	.4166	.3101	.5577	.5608	.5049	.4738	.665
R	.2202	.4630	.2447	.3005	.3804	.4187	.3379	.4041	.521
L	.4964	.5817	.5183	.3270	.3269	.3258	.5260	.4321	.660
(K)	.4967	.5340	.5376	.3942	.2683	.2821	.3920	.2480	.595

Table 13
Edumetric External Validity for Selected Cognitive Style Mapping Elements

Element	Element Gain Scores		Still Gain Scores(%)		Validity Coefficient
	Mean	Standard Deviation	Mean	Standard Deviation	
T(AL)	.4225	5.1229	45.3462	20.8169	.1736
Q(A)	1.5211	4.1175	64.9038	40.2694	.3071
Q(CK)	1.3803	4.6825	52.1154	13.3570	.3353
Q(CP)	1.4085	4.4834	36.4808	25.2857	.1150
Q(CS)	2.1127	4.9435	86.8077	26.2862	.2583

Table 14
Estimated Edumetric Reliability and Validity for Cognitive Style Mapping Elements

Element	Estimated Reliability Coefficient	Estimated Validity Coefficient
T(AL)	.828	.686
T(AQ)	.811	.658
T(VL)	.841	.707
T(VQ)	.906	.821
Q(A)	.803	.645
Q(O)	.861	.741
Q(S)	.927	.859
Q(T)	.865	.748
Q(V)	.822	.676
Q(P)	.862	.743
Q(CEM)	.844	.712
Q(CES)	.890	.792
Q(CET)	.862	.743
Q(CH)	.907	.823
Q(CK)	.854	.729
Q(CKH)	.871	.759
Q(CP)	.809	.654
Q(CS)	.883	.780
Q(CS)	.878	.771
A	.771	.594
F	.764	.584
I	.780	.608
M	.938	.880
D	.865	.748
R	.791	.626
L	.857	.743
(K)	.808	.653

APPENDIX C

THE DUVAL COUNTY SCHOOL BOARD

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May 14, 1979

Dr. Paul Becht
P. K. Young Lab School
1080 S. W. 11th Street
Gainesville, Florida 32611

Dear Dr. Becht:

Enclosed is a copy of the Success/Effectiveness Report and reliability and validity data on the project's Cognitive Style Mapping Inventory. I have also included a copy of the Inventory and Answer Sheet for your examination.

If you wish additional information or I can assist you further, please don't hesitate to contact me.

Sincerely,

Gail W. Wetmore

Gail W. Wetmore, Supervisor
ESEA, Title IV-C
Personalized Instruction
for Education
Tel. (904) 633-6085/6189

GWW:jr

Encs.

Internal Consistency Reliabilities
for the 'September' 1976 Administration of the
Cognitive Style Inventory

Element	Previous Reliability	#168 - n=458	#107 - n=317
T(AL)	.675 - k=16	.672	.568 - k=16
T(AQ)	.687 - k=16	.654	.751 - k=16
T(VL)	.762 - k=16	.733	.742 - k=16
T(VQ)	.396 - k= 8	.684	.737 - k=16
Q(V)	.632 - k= 8	.595	.543 - k= 8
A	.736 - k= 8	.767	.818 - k= 8
F	.669 - k= 8	.720	.774 - k= 8
I	.625 - k= 8	.685	.697 - k= 8
D	.666 - k= 8	.581	.584 - k= 8
M	.659 - k= 8	.643	.707 - k= 8
R	.606 - k= 8	.542	.646 - k= 8
K	.607 - k= 8	.584	.741 - k= 8

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APPENDIX D

OAKLAND
COMMUNITY
COLLEGE

George A. Bee
Administrative
Center
Bloomfield Hills, Michigan

March 12, 1975

I trust that in your conversations with Mr. Barney Herron, you understand that educational cognitive style is highly dependent upon what James Jenkins of the University of Minnesota, a theorist on the topic of memory, calls "contextualism." The basic notion underlying the use of a cognitive style test and inventory battery is to produce mathematical mappings which can be used by a trained mapper as aids to his empirical mappings of cognitive style elements. An analogy which might serve to clarify the issue would be that of how the medical doctor takes into account such mathematical mappings: body temperature, blood pressure, blood counts, counts of biochemical elements found in specimens of body fluids, and intensity counts associated with x-ray interpretations. In the process of questioning the patient to gain "empirical data" to diagnose the condition of the patient. Essentially, the medical doctor holds his empirical mapping process in a higher order oj priority, or, if you will, "weight," than the mathematical mappings, in the process of diagnosing an individual's condition of health. Contestualism enters into the doctor's diagnosis in the form of a series of norms and situations with which the physician is trained to become familiar. For example, a physician may diagnose a 55-year-old man to be in "good health" in comparison with norms for 55-year-old persons in the context of pursuits usually included in the life space of a 55-year-old individual. If the person being examined were to indicate to the physician that he was planning to engage in physical activities (e.g., skiing, swimming) at a level of competition usually found associated with 19-22-year-old varsity performers, the medical doctor might well revise his diagnosis of "good health" in consideration of that text.

Regardless of the matters noted above, I can provide you with validity and reliability indices that have been found, not only in some of our work here at the College, but in those doctoral dissertations (of the 84 that have been completed in this arena) dealing with community college samples. Under these circumstances, validity coefficients associated with the elements of T(VL), T(VQ), T(AL), and T(AQ) are as shown below:

T(VL) Females = .80
Males = .72

T(VQ) Females = .72
Males = .73

T(AL) Females = .75
Males = .70

T(AQ) Females = .66
Males = .61

Reliability coefficients are derived by means of the Kuder Richardson formula, based upon the concpet of domain sampling. The coefficients for T(VL), T(VQ), T(AL), nad T(AQ) are as shown below:

T(VL) Females = .93
Males = .92

T(VQ) Females = .92
Males = .93

T(AL) Females = .89
Males = .87

T(AQ) Females = .85
Males = .82

The validity and reliability coefficients associated with these elements of cognitive style mapping have been derived from sub-tests of the Differential Aptitude Tests (4th Ed. - Forms L and M - The Psychological Corp. - 1966), the Nelson-Denny Reading Test, the Carlsen-Brown Listening Test, and the quantitative section of the "Weschlor." Point by serial correlation coefficients for the qualitative symbolic elements, the cultural determinant elements of individuality, associates, and family; the modalities of inference elements of magnitude, difference, relationship, and appraisal show the range of values in biserial correlation coefficients indicated below:

$$\text{low } r_{bis} = .54 \text{ to } r_{bis} = .93$$

The average biserial coefficient value for all these elements is:

$$r_{bis} = .783$$

The reliability for the inventories that provide results for the mapping of these elements of style is a Kuder Richardson: r = .81. In regard to the topic of predictability, this matter depends greatly upon the ability of the diagnostician to empirically map the style of the individual under consideration in the context, or intended context, of the instructional setting.

I have asked my secretary to include a somewhat antiquated list of doctoral dissertations that have been completed in the Educational Sciences. Although I have copies of all the dissertations that have been completed in the Educational Sciences, many of them are on loan to persons currently engaged in doctoral dissertation work. Under these circumstances, I would be hard-pressed to make these materials available to you. If I can resolve any of your difficulties by telephone, I would be most happy to oblige.

Thank you for your interest in these matters, and also for your understanding of the inordinate delay in my response to your letter.

Sincerely,

(original signed by Joseph E. Hill)

Joseph E. Hill
President

JEH/sp

OAKLAND
COMMUNITY
COLLEGE

George A. Bee
Administrative
Center
Bloomfield Hills, Michigan

October 21, 1975

Mr. Bill Breese
1741 Francis Street, Room 14
Jacksonville, Florida 32209

Dear Mr. Breese:

Reliability coefficients derived by means of the Kuder-Richardson formula, based upon the concept of domain sampling, provide the best measurement of intercorrelation among elements and coefficients of stability. The Kuder-Richardson formula is used because it provides an excellent meausrement of internal consistency.

Validity and reliability indices that have been found in some of our work here at the College and in doctoral dissertations (of the almost 100 that have been completed) dealing with community college samples, show the following validity coefficients associated with the elements of TVL), T(VQ), T(AL), and T(AQ):

T(VL) Females = .80
Males = .72

T(VQ) Females = .72
Males = .73

T(AL) Females = .75
Males = .70

T(AQ) Females = .66
Males = .61

The reliability coefficients for T(VL), T(VQ), T(AL), AND T(AQ) are as shown:

T(VL) Females = .93
Males = .92

T(VQ) Females = .92
Males = .93

T(AL) Females = .89
Males = .87

T(AQ) Females = .85
Males = .82

The validity and reliability coefficients associated with these elements of cognitive style mapping have been derived from sub-sets of the Differential Aptitude Tests (4th Ed. - Forms L and M - The Psychological Corp. - 1966), the Nelson-Denny Reading Test, the Carlsen-Brown Listening Test, and the quantitative section of the "Wecshler." Point bi-serial correlation coefficients for the qualitative symbolic elements, the cultural determinant elements of individuality, associates, and family; the modalities of inference elements of magnitude, difference, relationship, and appraisal show the range of values of bi-serial correlation coefficients indicated below:

low r_{bis} = .54, to r_{bis} = .93

The average bi-serial coefficient value for all these elements is:

$$r_{bis} = .783$$

The reliability for the inventories that provide results for the mapping of these elements of style is a Kuder-Richardson: $r=.81$. In regard to the topic or predictability, this matter depends greatly upon the ability of the diagnostician to empirically map the style of the individual under consideration in the context, or intended context, of the instructional setting.

Utilization of a five-point response scale would, of course, be more desirable than the assignment of 1, 3, and 5 for answers of Rarely, Sometimes, Usually employed by our Diagnostic Center. An interval five-point scale, originally instituted by Dr. Hill, was, for practical considerations, changed by members of our Diagnostic Testing Center who felt that the three categories (Usually, Sometimes, Rarely) would simplify the response for students. Dr. Hill suggests that having students place their answers on a zero through ten scale with ten being at the upper limit of a normal distribution curve and zero at the lower limit would even further enhance the accuracy of the results.

I am enclosing an updated bibliography of dissertations completed in the Educational Sciences. Several of the more recent dissertations are concerned with the fourth set of cognitive style—memory.

Sincerely yours,

(original signed by Betty D. Setz)

Betty D. Setz, Director
Community Relations/
Research Administration

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BIOGRAPHICAL SKETCH

David L. Doney was born in Danville, Illinois, in 1941. He was educated in the Illinois public schools and received an Illinois State Scholarship and a Vermillion County (Illinois) Scholarship. He transferred to the University of Florida in 1961 and received a Bachelor of Science degree in broadcasting in 1963. He worked as a producer-director for WMUB-TV in Oxford, Ohio, and studio supervisor and film director for WFSU-TV in Tallahassee, Florida. In 1965, he was employed as a sales representative for the Colgate-Palmolive Company. In 1966, he entered the United States Air Force and served as the 34th Air Division Public Information Officer until 1970. He was discharged as a captain. He entered the Master of Education program at the University of Florida and was graduated 1971. At that time, he was elected to the honor society of Phi Kappa Phi. He served as media specialist in Sarasota and Pinellas Counties and continued his course work toward the Doctor of Education degree. While completing his dissertation in 1979, he was employed by Western Montana College, where he is an assistant professor of education.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Gordon Lawrence

Gordon Lawrence, Chairman
Associate Professor of
Instructional Leadership & Support

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education

Donald Avila

Donald Avila
Professor of Foundations of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Lee Mullally

Lee Mullally
Associate Professor of
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I certify that I have read this study and that in my opinion it comforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality, as a dissertation for the degree of Doctor of Education.

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This dissertation was submitted to the Graduate Faculty of the Division of Curriculum and Instruction in the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Education.

August 1980

Dean for Graduate Studies and Research